

MARINE REVIEW.

Vol. XIV.

CLEVELAND, O., DECEMBER 3, 1896.

No. 23.

Ship Building Contracts.

A SUMMARY OF THE PRINCIPAL WORK NOW UNDER WAY IN LAKE SHIP YARDS—ASSURANCE OF AN ACTIVE WINTER.

A summary of ship building orders shows that contracts have already been made with lake builders for sixteen big freight vessels valued at \$2,285,000 and capable of carrying, on 16 feet draft, about 61,050 gross tons of cargo. It is quite probable, of course, that other contracts, on which negotiations are now pending, will be closed within a few weeks, and there are also some arrangements practically completed for small vessels that are not included in this list. Of the sixteen vessels noted in the table, all but three are of steel and of the largest type. Seven are steamers and nine are barges. In January last there were sixty-five vessels of all kinds, large and small, under contract in lake yards, and their aggregate value was \$8,549,000. Forty-two of these were freight-carrying vessels, capable of moving 136,600 gross tons on 14½ feet draft.

As noted in the table, the Union Dry Dock Co. of Buffalo will go ahead with the construction of a steel package freight steamer that will be a duplicate of the Union liner Ramapo, with the exception

A Collision Apron.

English exchanges refer to a collision apron that might prove valuable if carried aboard steel vessels on the lakes, especially in event of collisions in the rivers. The apron is intended to be lowered into the water after collision to cover up the fracture, and in some cases it is claimed that it will thus prevent the sinking of an injured vessel. It is made of No. 1 tarpaulin, in three folds, and to keep it flat, when applied to a fracture, it is fortified by wooden battens, inserted at intervals of twelve inches, the battens running crossways. This provision, in addition to strengthening the apron, and keeping it from being sucked through the fracture, also causes it to unroll evenly as it is drawn downwards by the suction from beneath the water line. At the center of each edge—that is fore and aft—a guy line is attached, and as the apron is applied these lines are made fast to the railing. To the bottom of the apron two galvanized chains are fixed, and being passed round the bows of the ship, and let slack under the keel, are drawn tight on the opposite side. This is only required if an accident occurs in rough weather, acting as binders to keep the apron firm should the vessel be rolling.

Orders for Winter Work in Lake Ship Yards.

Builders.	Class.	Dimensions*	Capacity. Gross Tons, 16 feet draft.	Value.	For Whom Building.
Chicago Ship Building Co., Chicago, Ill...	Steel freight steamer	426-48-28	5,000	\$240,000	A. B. Wolvin, Duluth, Minn.
Chicago Ship Building Co., Chicago, Ill...	Steel freight steamer	255 42-23	2,500	115,000	R. R. Rhodes, Cleveland, O.
Chicago Ship Building Co., Chicago, Ill...	Steel freight steamer	255-42-23	2,500	115,000	R. R. Rhodes, Cleveland, O.
Chicago Ship Building Co., Chicago, Ill...	Steel tow barge	365-44-26	4,550	125,000	C. W. Elphicke, Chicago, Ill.
Chicago Ship Building Co., Chicago, Ill...	Steel tow barge	388-46-26	5,100	140,000	James Corrigan, Cleveland, O.
Cleveland Ship Building Co., Cleveland, O.	Steel freight steamer	420-48-28	4,900	235,000	Capt. Thomas Wilson, Cleveland, O.
Cleveland Ship Building Co., Cleveland, O.	Steel freight steamer	426-48-28	5,000	240,000	A. B. Wolvin, Duluth, Minn.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge	388-46-26	5,100	140,000	James Corrigan, Cleveland, O.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge	378-44-26	4,850	130,000	Bessemer Steamship Co., Cleveland, O.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge	377-44-26	4,850	130,000	Not as yet made public.
Union Dry Dock Co., Buffalo, N. Y.....	Steel freight steamer	346-44-28	3,000	210,000	Union Steamboat Co., Buffalo, N. Y.
Union Dry Dock Co., Buffalo, N. Y.....	Steel oil barge	254-40-23	.....	80,000	Standard Oil Co., New York, N. Y.
James Davidson, West Bay City, Mich....	Wooden freight steamer..	237-41-26	2,000	75,000	James Davidson, West Bay City, Mich.
James Davidson, West Bay City, Mich....	Wooden tow barge	300-45-26	3,400	90,000	James Davidson, West Bay City, Mich.
James Davidson, West Bay City, Mich....	Wooden tow barge	300-45-26	3,400	90,000	James Davidson, West Bay City, Mich.
American Steel Carge Co., W. Superior, Wis.	Steel tow barge	380-44-26	4,900	130,000	Inter-Lake Transit Co., Cleveland, O.
			61,050	\$2,285,000	

*Length is over all; depth is moulded.

of an addition of 6 feet in length. The Globe company, Cleveland, has made all arrangements for the building of three tow barges, one of which, for James Corrigan of Cleveland, is to be a duplicate of the boat to be built for that gentleman in Chicago; the second barge is the Rockefeller boat, for which a contract was let some time ago, and although the third boat is reported as building on yard account, it is more than probable that a sale has already been practically effected.

On Wednesday, Dec. 30, the light-house board, Washington, D. C., will open bids on five vessels, as noted in an advertisement elsewhere in this issue. Three of these vessels will be first-class composite light-vessels and two will be light-house tenders. These contracts have been referred to in previous issues of the Review. All the vessels are of a size that will admit of their being built on the lakes and taken to the coast through the St. Lawrence.

Capt. C. E. Benham and other members of the maritime board, Cleveland chamber of commerce, are endeavoring to secure the repeal of a city ordinance which provides for the closing of all bridges for a full hour morning and evening.

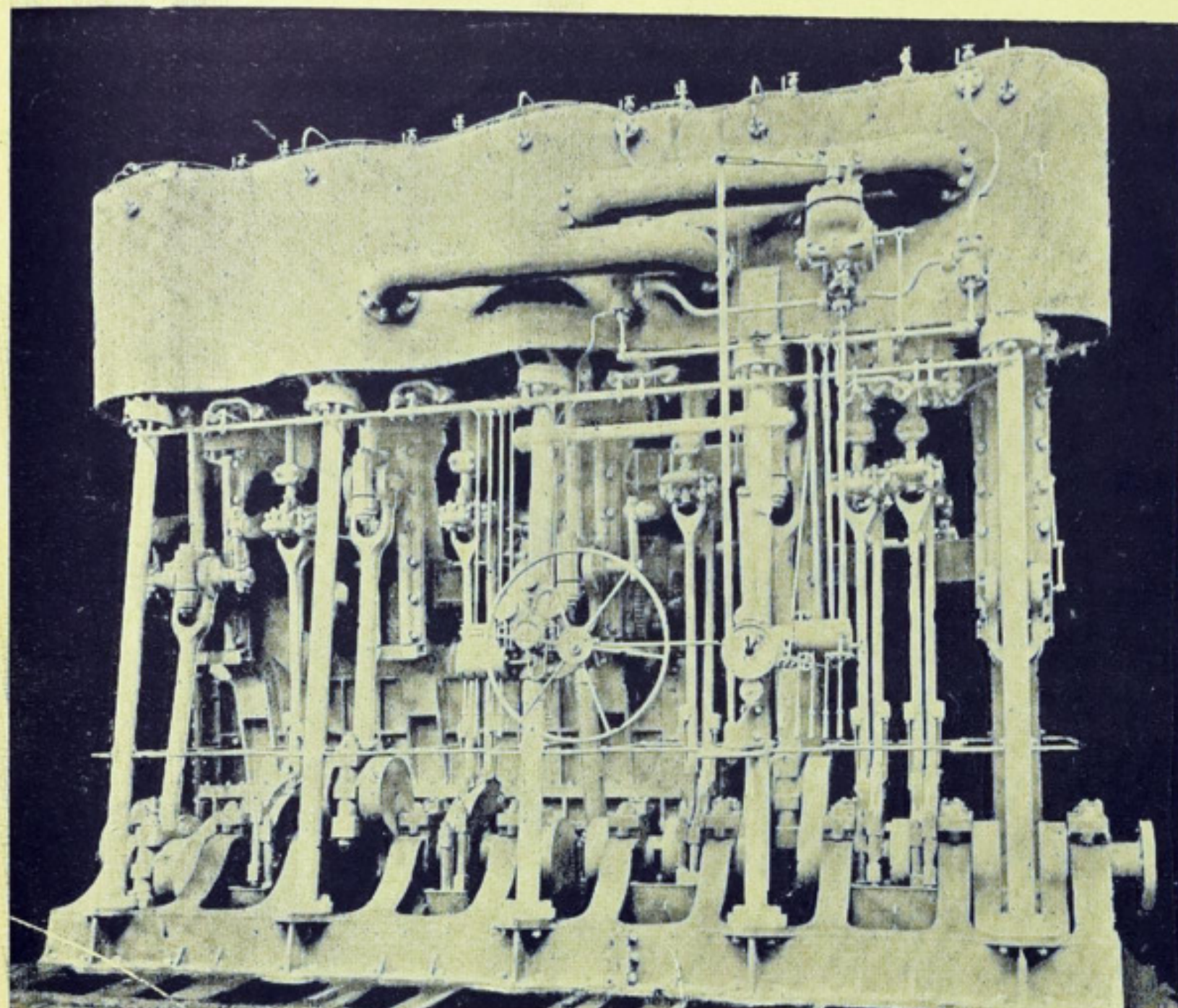
On the inside of the apron strong loops and ropes are attached, so that it may be still further secured while temporary repairs are being made to allow the ship to make port. One leading feature is the automatic and speedy action, and the adoption of wooden battens in place of metal. The first impression of many persons is that the wood employed would cause the apron to float. On the contrary, it is said, the action is rapid, and it goes straight to its work in a few seconds.

Meetings are again being held in Cleveland by the association of Bessemer ore dealers, preparatory to a renewal of agreements covering another year's business. It is confidently expected that the association will be continued, although there are, of course, a great many different interests to conciliate. Statistics as to stocks of ore sold and unsold, and other information bearing on the future of the iron market, were features of discussion at the meetings held during the past few days.

It is proposed to have the Michigan legislature change the name of the Michigan Mining School to Michigan College of Mines.

A QUEER COINCIDENCE! THAT SERVE RIBBED TUBES AND ELLIS AND EAVES DRAFT

SHOULD BE IN THE BOILERS OF THE
Two Most Economical Cargo Steamers in the World!



ENGINES OF THE INCHMONA—

Hull, 325 feet long,
46½ " beam,
20½ " draft,

Engines, 17, 24, 34, 42 and 42 x 42 in. stroke.

THE BOILERS ARE FITTED WITH SERVE
RIBBED TUBES AND THE ELLIS AND
EAVES DRAFT.

This steamer carries 5,000 tons cargo, 9 knots
an hour on a daily fuel consumption of 11½
tons coal. This amounts to 1.07 lbs. of coal
per horse power per hour, over ½ pound
less than the best showing made by any
lake steamer with any kind of draft, and
the lowest ever obtained in marine practice.

ENGINES OF THE KENSINGTON—
(AMERICAN LINE.)

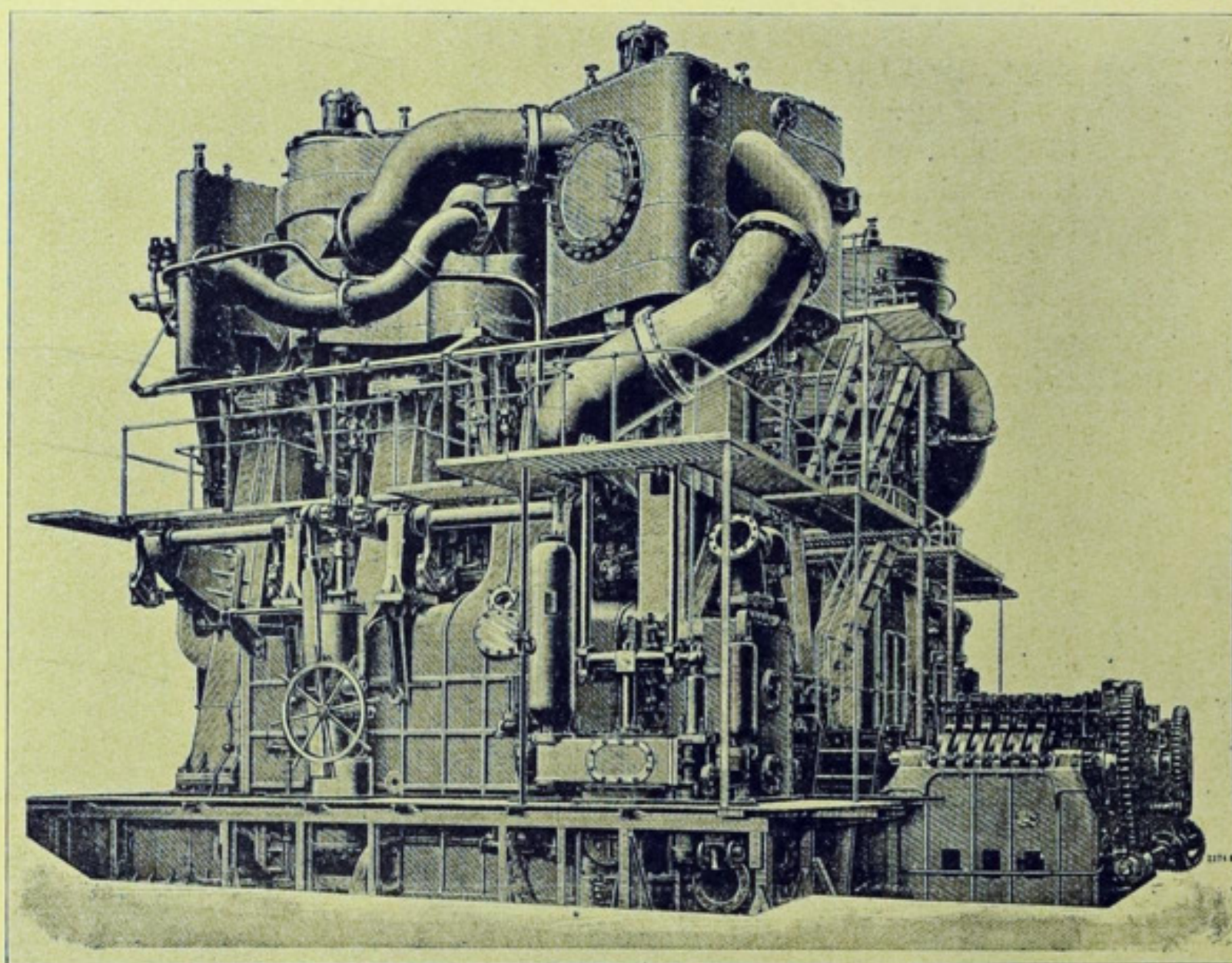
Hull, 480 feet long,
57 " beam,
40 " deep.

Twin Engines, 25½, 37½, 52½ and 74 x 54
in. stroke.

Boilers, Two Double-ended,
15 ft. 9 in. by 21 ft. 5 in.
One Single-ended,
15 ft. 9 in. by 11 ft. 3 in.

FITTED WITH SERVE RIBBED TUBES AND
THE ELLIS AND EAVES DRAFT.

Coal consumption per I. H. P. per hour on this
steamer is 1.4 lbs. This is ¾ lb. less
than the average lake steamer. Her cargo
capacity is 10,600 tons.



Serve Ribbed Tubes and the Ellis and Eaves Induced Draft are to be installed in at least
two lake steamers during the coming winter,—and it can be guaranteed that these steamers
will have a fuel consumption as low as 1½ lbs. per I. H. P. per hour. A result of 1¼ lbs. has been
obtained with the Ellis and Eaves Draft and Plain Tubes in the L. C. Waldo.

Owners of steamers contemplating repairs to boilers during the coming winter can learn how they can save the cost
of the repairs in one season, by writing to

THE GLOBE IRON WORKS COMPANY, CLEVELAND, OHIO.

Big Improvements at Conneaut.

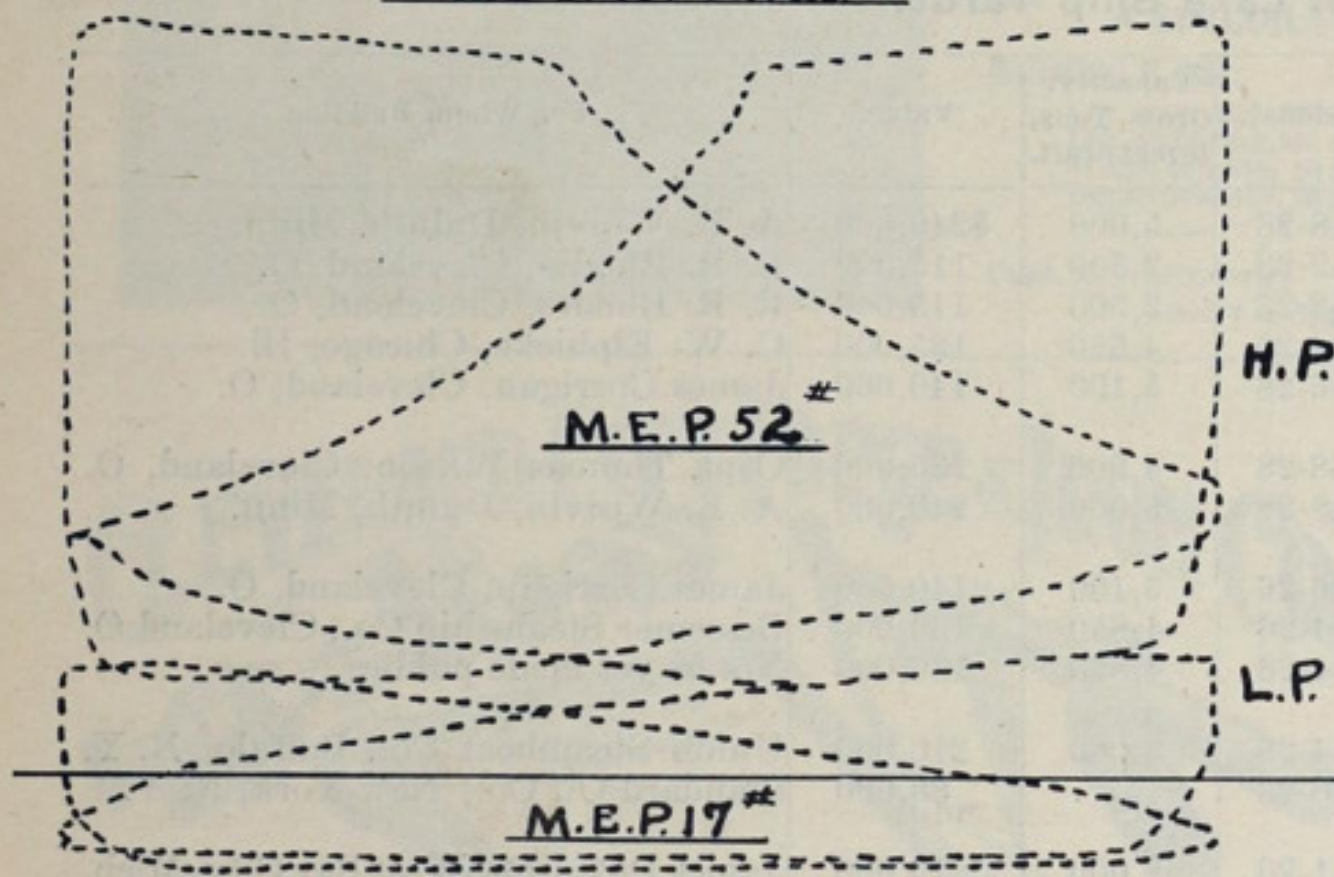
Dock improvements to be made at Conneaut, as a result of the Carnegie interest in that port, are to be of a very extensive kind. All arrangements have been made for the construction of a slip on which about 2,000 feet of dock will be built, making in all about 4,000 feet of dock at Conneaut for the handling of coal and ore. Hingston & Woods of Buffalo will build the new dock, but all contracts for the equipment have not as yet been let. The new equipment will consist of a car dumping machine for handling coal, and two modern fast ore unloading plants, each of twelve legs, suited to vessels of the 400-foot type. One of the new ore plants will be adapted to loading direct into cars, while the other will be of the hoisting and conveying kind, suited to the storage of ore. As Conneaut already has a big stretch of dock equipped with two Brown rigs of three legs each, three King rigs of two legs each and six revolving derricks, it is evident that the amount of business to be done there in the future will be very large. This is all due, of course, to the arrangement under which the Carnegie company now controls the Pittsburg, Shenango & Lake Erie Railroad and is engaged in extending that line by a direct route into Pittsburg.

Test of the City of Buffalo.

The Detroit Dry Dock Co., builders of the City of Buffalo, the fastest and finest side-wheel steamer on the lakes, have just had an engineering test made on the vessel, and the results are printed here—

S.S. "City of Buffalo," Nov. 6th 1896

Indicator Cards



Steam 95[#] H.P. 1276 Spring { H.P. } 1/60
 Rev. 23.83 L.H.P. { L.P. 1481 }
 Total 2757

Cylinders: { H.P. 52" Dia. x 8 ft. - 0" Stroke
 L.P. 80" " x 12 ft. - 0" "

with. No attempt was made to develop a high rate of speed, as the test was purely of a commercial kind, so to speak, the work being undertaken without any special preparation, and with only four of the six boilers in operation, as has been the case during the whole season, while the steamer has been making the Cleveland-Buffalo run regularly in ten hours. On this occasion her time from breakwater to breakwater was 10 hours and 3 minutes. The coal consumption which is given as 1.78 pounds per hour per I. H. P., is regarded as remarkable for a compound engine, and it will be noted that in this calculation is included coal used for all purposes, while the I. H. P. is for the main engines only. No allowance is made for ashes or for auxiliary machinery of any kind. Among the auxiliaries are an electric light engine, ventilating engine, sanitary pumps, etc. Coal was of the ordinary quality, such as the Cleveland & Buffalo people have been accustomed to use. It is understood that this test shows a performance that may be compared with the best results obtained from the

high-class steamers of this kind operating on Long Island sound. The City of Buffalo is equipped with the Howden system of hot draft.

Hull—Steel, 308 feet over all, 298 feet keel, 41 feet beam, 75 feet over guards, 17 feet 4 inches depth, all moulded.

Engines—Compound with high pressure cylinder of 52 inches by 8 feet stroke and low pressure of 80 inches by 12 feet stroke.

Boilers—Six cylindrical, 12 feet 6 inches diameter by 12 feet length; 130 pounds pressure. Only four boilers were in use. Each boiler has two furnaces of 44 inches diameter and 5 feet 6 inches grate bars. Total grate surface 242 square feet; grate surface of four boilers, 161 1-3 square feet. Total heating surface 11,556 square feet; heating surface four boilers 7,704 square feet. Ratio of heating surface to grate surface 47.7.

Fans—Two of 66 inches diameter wheel by 35 inches wide. Engines double, 5 inches by 5 inches.

Heater—22 inches diameter by 11 feet 8 inches long. Heating surface 322 square feet.

Wheels—28 feet 6 1/2 inches diameter to outside of buckets. Eleven buckets, 12 by 4 feet.

Time—Left Buffalo	7:44 p. m., Nov. 6	Miles
Passing Buffalo breakwater	8:17 p. m., Nov. 6	—
Passing Port Colborne	9:15 p. m., Nov. 6	15 1/2
Passing Dunkirk	10:17 p. m., Nov. 6	18 1/2
Passing Long point,	11:57 p. m., Nov. 6	28 1/2
Passing Ashtabula	3:05 a. m., Nov. 7	56
Passing Fairport	4:37 a. m., Nov. 7	26 1/2
Passing Cleveland breakwater	6:20 a. m., Nov. 7	28 1/2
Arrived Cleveland	6:40 a. m., Nov. 7	173

Steam pressure, pounds	95
Air pressure, inches	3 4-10
Vacuum, inches	24
M. E. P., high pressure, pounds	52
M. E. P., low pressure, pounds	17
M. E. P., referred to L. P., pounds	31.2
I. H. P., high pressure	1,276
I. H. P., low pressure	1,481
I. H. P., total of main engine only	2,757
Revolutions of main engine	23.83
Ratio of horse power to grate surface	17 to 1
Ratio of heating surface to horse power	2.8 to 1
Coal burned for all purposes, pounds	31,800
Time of trial, hours, minutes	6:29
Coal burned per hour, pounds	4,892
Coal burned per hour, per I. H. P. (coal burned for all purposes; I. H. P. of main engine only), pounds	1.78
Coal burned per hour per square feet of grate surface, pounds	30.3
Speed of boat, miles per hour	17.22
Speed of wheel at outside buckets, miles per hour	24.28
Slip of wheel, per cent	29
Temperature of hot well, degrees	115
Temperature of feed water heater, degrees	180

Orders for new vessels in Atlantic coast ship yards are also increasing. Among those noted recently are the following: Neafie & Levy Ship & Engine Building Co. of Philadelphia—A steel excursion steamer for the Winthrop Steamboat Co. of Boston; 150 feet in length and to be fitted with triple expansion engines. J. H. Dialogue & Sons, Camden, N. J.—A steel steamer for the Smyrna Transportation Co., to ply between Smyrna and Philadelphia; length about 150 feet and cost about \$30,000. New England Ship Building Co.—A wooden steamer for Kennebec & Boston Steamboat Co.; dimensions 210 by 40 by 13 feet; triple expansion engines to be built by the Bath Iron Works. Charles B. Harrington, Bath, Me.—Wooden excursion steamer for Mt. Kineo Hotel Association; dimensions 75 by 13 by 5 feet. J. N. Robins Co. of Erie Basin, New York—A steel steam yacht 175 feet long for Harrison B. Moore. Shearer Machine Works, Atlanta, Ga.—A tug 30 feet long, which will be taken to the coast by rail for service at Savannah. John C. Froehlich & Co., Baltimore—A tug 65 feet long for Meredith & Winship of Georgetown, D. C. Harlan & Hollingsworth Co., Wilmington, Del.—Steel passenger steamer for Merchants & Miners' Transportation Co.; dimensions 270 by 42 by 34 feet; cost, \$330,000.

Buffalo's Big Breakwater Job.

Although bids on Buffalo's big job of breakwater work, which were opened, Monday, by United States Engineer Symonds, have not been fully figured up as yet, it is more than probable that the contract, which involves nearly \$2,000,000 worth of work, will go to Hughes Bros. & Bangs of Syracuse, N. Y., who were the principal contractors on the big canal lock recently completed at Sault Ste. Marie. Names of the firms who submitted bids on the work are: Andrew Onderdonk, New York; Hughes Bros. & Bangs, Syracuse, N. Y.; Buffalo Dredging Co., Buffalo; Hingston & Woods, Buffalo; James B. Donnelly, Buffalo; Churchyard & Dunbar, Buffalo; McArthur Brothers & Co., Chicago; National Contracting Co., New York; John B. Breymann, Toledo; Chicago Star Construction Co., Chicago; L. P. & J. A. Smith, Cleveland, and Christie & Lowe, Chicago. Proposals of the three lowest bidders roughly figured are: Hughes Bros. & Bangs—For the rubble-mound breakwater, \$678,400; for the timber-crib breakwater, \$1,077,225; for the sand-catch pier, \$7,705.62; total, \$1,763,330.62½. Andrew Onderdonk—Rubble-mound breakwater, \$902,400; timber-crib breakwater, \$1,181,725; sand-catch pier, \$7,059; total, \$2,091,184. James B. Donnelly—Rubble-mound breakwater, \$1,067,200; timber-crib breakwater, \$1,038,325; sand-catch pier, \$4,827.68½; total, \$2,110,352.88½.

The greatest surprise was expressed at the bids submitted for the work of excavating. The dredging will be of a nature probably never before attempted in submarine engineering, and certainly not on the lakes. The greatest depth at which such work has heretofore been undertaken on the lakes was 60 feet. In Montreal harbor the dredgers worked at a depth of 60 feet, but in a material far less formidable than is the mud and silt which will be encountered in this breakwater extension. About 30 feet of water is lying over this deposit in the Buffalo harbor, and below this is from 35 to 45 feet of the worst composition which dredgers are called upon to handle. While the actual base of the breakwater is 100 feet, it will be necessary to dredge out a channel nearly a quarter of a mile wide to allow for a settling of the soft mud which will be induced by the inconsistency of the formation. On this part of the work two bids, which were the lowest and of the same amount, were received from Churchyard & Dunbar and Hughes Bros. & Bangs. Both firms offered to do this dredging at 18 cents a yard.

Changes in the Corona's Boilers

The Globe Iron Works Company announce that they have contracted to equip the boilers of one of the Mutual line steamers with Serve ribbed tubes and the Ellis & Eaves system of draft. In addition to this it is planned to put a similar equipment on one of the largest of the new steel freighters, particulars of which will be announced later. The use of the Ellis & Eaves draft in the L. C. Waldo, places the system beyond the experimental stage on the lakes, and it only remains to be seen how much more economy the Serve tubes will add to the draft. The builders claim 15 per cent. As the Waldo's coal consumption was 1.79 pounds, the addition of the Serve tubes should bring the consumption of the Corona, all other things being equal, down to 1½ pounds, or very close to it. The simplicity of the system, it being an inducing or strengthening of the natural draft, is the strong point made by its advocates.

The publication of cards from the engines of the American liner St. Paul, showing a consumption of 1.22 pounds, attracted considerable attention. The American representative of the Serve tube claims this would be even less had they used Serve tubes of 3¼ inches diameter, instead of Serve tubes 2¼ inches diameter, with which her boilers are now fitted. Forced draft is used in the St. Paul in addition to the special tubes. Carrying 5,000 tons of cargo 9 knots an hour on a consumption of less than a half ton an hour are remarkable results obtained in the Inchmona, an English cargo steamer 325 feet long and 46½ feet beam, having five-crank engines of 1,200 horse power. Aside from depth, this steamer compares well with the latest lake steamers, with the single exception of fuel consumption, the lake steamers using about twice this amount of fuel. This economical showing is obtained by five-crank engines and the use of Serve ribbed tubes and the Ellis & Eaves draft in the boilers.

E. P. Wilson of Cincinnati, secretary of the National Association of Manufacturers, announces that the second annual convention of the association will be held in Philadelphia Jan. 26, 27 and 28.

Result of Navy Tests on the Lakes.

Commodore Melville of the bureau of steam engineering, navy department, refers in a general way in his annual report, which is just at hand, to boiler tests made on the lake passenger steamer North West, and the lake freight steamers Victory and Zenith City. It is well known that these tests, which were conducted by the department some time ago, were made first on the Northern line passenger boat on account of her equipment of Belleville water tube boilers, and then on the two freight boats, which are duplicates, on account of one of them having ordinary cylindrical boilers and the other Babcock & Wilcox water tube boilers. The report says:

"The question of the water tube boiler is one that is absorbing the attention of designers of naval machinery, and the aim is to get a boiler which, while being reasonably light, shall be capable of easy repair in case of a ruptured tube, and contain so much water that a slight derangement of the feed apparatus will not result in burning out the boiler. The tests made by the bureau were on steamers on the great lakes. The first steamer experimented with was fitted with Belleville boilers, the second with Babcock & Wilcox boilers. For the purpose of comparing the results in the latter case with what might be expected from ordinary cylindrical boilers under similar conditions of service, a like test was made on another steamer, identical with the one equipped with Babcock & Wilcox boilers, in every respect alike except the boilers. As a result of these tests it was decided to put a Babcock & Wilcox boiler in the Chicago for one half her power, 4,500 indicated horse power. Subsequent to the award of the contract the department approved the request of the contractors for the construction of gunboat No. 10 and for gunboat No. 15 to supply this type of boiler instead of the cylindrical one of the original design. The fitting of this boiler in the two classes of gunboats will furnish a good opportunity to demonstrate its value as compared with the cylindrical boilers fitted in the other gunboats of the same class."

Funds for River and Harbor Work.

At the short session of congress, which opens next week, appropriations for river and harbor work will be of very little importance. They will apply only to a few contract works that have been under way for some time past. No appropriations will be made for the works that were included in the continuous contract system at the last session. But the greater part of the big appropriations of the last session is yet to be expended, as explained in the following paragraph from the annual report of the secretary of war, an abstract of which has just been received:

"The total expenditures for river and harbor purposes during the year ending June 30, 1896, including those of the Mississippi and Missouri river commissions, was \$17,039,731.51. Including the amounts appropriated by the act of June 3, 1896, there was available for expenditure on rivers and harbors July 1, \$26,020,974.79. The act mentioned, in addition to the direct appropriations, also authorized the secretary of war to enter into contract for the completion of a comparatively large number of specified works, payments for the same being contingent on future appropriations. This discretion is only now being exercised by the department, and not in all cases, and it is too early to state the results. In several instances the money provided was so disproportionate to the amount required to make a beginning this year that nothing could be gained by pledging the department in contract at this time. The local engineers have prepared statements showing the amounts that can be profitably expended during the next fiscal year on the various rivers and harbors for which projects of improvement have been approved by congress, and for which appropriations have heretofore been made in river and harbor appropriation acts. Such amounts are given in the various appendices to the report of the chief of engineers, but the estimates submitted to congress only include the amounts for which the government is obligated by existing contracts. It is understood that the appropriations for other works made by the act of 1896 were to cover the operations of two years, and that no further appropriations will be made for such works by the present congress."

French naval authorities are again said to be elated over a submarine torpedo boat. Experiments at Toulon with the Gustave Zede are said to have been so successful that the French minister of marine has decided to order several of the vessels.

United States Life Saving Service.

According to the report of General Superintendent Kimball, the United States life saving establishment comprised on June 30, 1896, a total of 256 stations, of which 186 were located on the Atlantic and Gulf coasts, fifty-five on the great lakes, fourteen on the Pacific coast, and one at the falls of the Ohio at Louisville, Ky. The number of accidents to documented vessels within the scope of the service was 437, involving 4,608 persons, of which 4,595 were saved and thirteen lost. The estimated value of the vessels was \$8,880,140, and of the cargoes \$3,846,380, aggregating a total of \$12,726,520. Of this amount \$1,432,750 was lost. The number of documented vessels totally lost was sixty-seven. There were also during the year 243 casualties to undocumented crafts, sail boats, row boats, etc. Of the 594 persons on board 587 were saved and seven lost. The value of the property in those casualties is estimated at \$119,265, of which \$114,915 was saved. During the year the crews saved and assisted to save 472 vessels with their cargoes valued at \$4,853,110. The cost of maintaining the service for the year was \$1,401,805.

Average Lake Freight Rates.

WILD AND CONTRACT RATES ON COAL, ORE AND GRAIN FOR THE PAST SEASON COMPARED WITH A RECORD OF RATES FOR TWENTY YEARS PREVIOUS.—LOW FIGURES FOR 1896.

Average rates of freight on ore, coal and grain during the season of 1896, as prepared from a record of daily rates kept by the Marine Review, are compared in the following tables with the rates of previous years. It must be understood that these rates are not averages on quantities of freight. They are the averages of rates ruling from day to day throughout the season. It may be well to note in connection with these averages, that season ore contracts were made last spring at \$1.05 from the head of Lake Superior, 95 cents from Marquette and 70 cents from Escanaba, and that some soft coal was contracted at 47½ cents to Milwaukee, 45 cents to Green Bay, and 40 cents to Portage and Duluth. The average "wild" rates of the season are: Iron ore—Escanaba to Ohio ports, 52 cents; Ashland, 77 cents; Marquette, 66 cents. Grain—Wheat, Chicago to Buffalo, 1.7 cents; wheat, Duluth to Buffalo, 2.2 cents. Soft coal—Ohio ports to Milwaukee, 33½ cents; to Duluth, 29½; to Portage, 32; to Escanaba, 27; to Manitowoc, 32; to Sheboygan, 30; to Green Bay, 32½. Hard coal—Buffalo to Chicago, 36 cents; to Milwaukee, 34½; to Duluth, 24; to Toledo, 25.

AVERAGE FREIGHT RATES ON IRON ORE FROM PORTS NAMED TO OHIO PORTS—A TABLE COVERING WILD AND CONTRACT RATES FOR TWENTY YEARS PAST.

YEAR.	ESCANABA.		MARQUETTE.		ASHLAND AND OTHER PORTS AT THE HEAD OF LAKE SUPERIOR.	
	Wild or daily rate.	Contract rate.	Wild or daily rate.	Contract rate.	Wild or daily rate.	Contract rate.
1877	\$0 98	\$1 00	\$1 41	\$1 40	....	....
1878	81	90	1 22	1 30	....	....
1879	1 25	90	1 83	1 40	....	....
1880	1 70	1 85	2 26	2 75	....	....
1881	1 36	1 75	2 05	2 45	....	....
1882	1 04	1 40	1 26	1 75	....	....
1883	1 22	1 00	1 40	1 20	....	....
1884	87	1 10	1 08	1 35	....	....
1885	78	90	98	1 05	\$1 25	\$1 15
1886	1 28	1 05	1 51	1 20	1 78	1 20
1887	1 59	1 40	1 87	1 63	2 23	2 00
1888	1 05	90	1 30	1 15	1 43	1 25
1889	1 01	1 00	1 19	1 10	1 34	1 25
1890	89	1 10	1 07	1 25	1 17	1 35
1891	84	65	1 02	90	1 11	1 00
1892	74	1 00	98	1 15	1 15	1 25
1893	56	85	71	1 00	77	1 00
1894	46	60	60	80	78	80
1895	73	55	92	75	1 13	80
1896	52	70	66	95	77	1 05

Charge to vessel for trimming and unloading, 19 cents a ton.

Average ore rates for the entire period of twenty years: Escanaba, contract \$1.03, wild 98 cents; Marquette, contract \$1.33, wild \$1.27. Average for past ten years: Escanaba, contract 87½ cents, wild 84 cents; Marquette, contract \$1.07, wild \$1.03; Ashland and other ports at the head of Lake Superior, contract \$1.17½, wild \$1.19.

AVERAGES OF DAILY RATES ON SOFT COAL FROM OHIO PORTS TO MILWAUKEE, ESCANABA, DULUTH, GREEN BAY AND MANITOWOC.

Year.	Milwaukee.	Escanaba.	Duluth.	Green Bay.	Manitowoc.
1887.....	\$1 06	\$0 72	\$0 89	.....	.....
1888.....	84	61	66	.....	.....
1889.....	54	49	52	.....	.....
1890.....	64	45	49	.....	.....
1891.....	61	52	49	.....	.....
1892.....	58	43	43	\$0 55	\$0 49
1893.....	48	40	38	50	41
1894.....	48½	39	37½	49½	48
1895.....	54	39	36½	50	51
1896.....	33½	27	29½	32½	32
Average ten years	61	47	49	47½	44

Chicago rate about same as Milwaukee.

Coal of all kinds shipped in net tons and handled without charge to vessel.

AVERAGES OF DAILY LAKE FREIGHT RATES ON HARD COAL FROM BUFFALO TO CHICAGO, DULUTH AND TOLEDO, DURING TEN YEARS PAST.

Year.	Chicago.	Duluth.	Toledo.
1887.....	\$1 05	\$0 70	\$0 35
1888.....	86	65	41
1889.....	52	41	27
1890.....	62	43	33
1891.....	56	29	25
1892.....	59	43	27
1893.....	49	29	28
1894.....	46	25	25
1895.....	59	24	30
1896.....	36	24	25
Average for ten years.....	61	39	30

Rate to Milwaukee about 2½ cents less than Chicago, and Detroit rate about the same as Toledo rate.

AVERAGES OF DAILY RATES OF FREIGHT ON WHEAT FROM CHICAGO TO BUFFALO DURING THE PAST NINETEEN YEARS.

Year.	Wheat.	Year.	Wheat.
1878.....	3.1 cents.	1889.....	2.5 cents.
1879.....	4.7 "	1890.....	1.9 "
1880.....	5.7 "	1891.....	2.5 "
1881.....	3.2 "	1892.....	2.2 "
1882.....	2.5 "	1893.....	1.8 "
1883.....	3.5 "	1894.....	1.3 "
1884.....	2.1 "	1895.....	1.9 "
1885.....	2 "	1896.....	1.7 "
1886.....	3.6 "	Aver. nineteen years..	2.8 "
1887.....	4.1 "		
1888.....	2.7 "		

Charges to vessels for shovelling, trimming and tallying weights of grain foot up about \$4.75 per 1,000 bushels.

Additions to a Big Ship Building Plant.

An addition to the machine shop at the Newport News Ship Building and Dry Dock Co.'s works, which has just been decided upon, will give that company a machinery plant 500 feet long and 100 feet wide. The works are already among the finest in the world. This improvement is prompted by the several big naval contracts which the company has secured recently. About 2,600 men are now employed at these works, and it is expected that the number will shortly be increased to nearly 3,000. The foundry which furnishes castings for the Newport News works is 162 by 95 feet, and is controlled by iron traveling cranes of 25 ton and 10 ton capacity respectively, as well as several jib cranes on side floors. A high pressure cylinder cast recently for the battleship Kearsarge weighed 1,800 pounds. One ladle used in the foundry is of 20,000 pounds capacity. The manganese bronze propeller blades are now being made and as each one weighs 4,500 pounds, they are considered a nice piece of foundry work. The contract for the addition to the machine shop, referred to above, has been awarded to the Berlin Iron Bridge Co. of East Berlin, Conn.

Capt. Dunn of the Dominion steamer Petrel has orders from the department of marine and fisheries at Ottawa to blow up the steamer Cottrell, which is sunk in Canadian water near the mouth of the Detroit river. The Cottrell has been struck a couple of times since she was sunk by passing vessels. The last vessel that struck her carried away the spar that marked the wreck, but a red spar buoy was immediately placed over the spot by Capt. Andrew Hackett of Amherstburg.

If we did not get your boat in the list of sixty which we had photographed in the Detroit river, we can get a picture of her if she passes the Sault in daylight.

Compromise Bridge Proposition.

Editor Marine Review:—It is not surprising that the vessel interests on the great lakes are united in opposing the Detroit river bridge bill as proposed by the Michigan Central Railroad Co. The United States government annually appropriates millions of dollars to free the channels and connecting waters of the great lakes of obstructions and dangers to navigation, and the government is now asked by a Vanderbilt railroad to permit two great stone abutments to be placed in the harbor opposite the city of Detroit. There are few harbors in the world that are as crowded with vessels as is the Detroit river during the season of navigation from April until December. During those months over 36,000,000 tons of vessel property passes up and down this river (more than the tonnage of all the Atlantic seaports combined, including New York), the river being less than half a mile wide at this point. Besides the through traffic there are ferry boats constantly crossing and recrossing the river and vessels rounding to at the wharves on both sides of the stream, and lying at anchor, while great timber rafts, which at times take up the entire channel, are almost daily to be seen.

Two great obstructions in the harbor of Detroit, in the form of massive stone piers, would render navigation extremely dangerous, especially at night, when the lights of the city are most confusing to the mariner. (To appreciate this one must pass through the river on a dark night). Again, in winter time the strong current would jam the ice against the bridge piles and form a solid dam, perhaps delaying the opening of navigation in the spring. If a bridge is to be built, it should cross the river in a single span without piers in the harbor, or it should be built down the river (and not within the city limits as the bridge bill provides), where there is only through traffic and no ferries or vessels rounding to at wharves, and no city lights to bother the mariner.

B. Ridge.

Detroit, Mich., Nov. 28, 1896.

(The writer of the foregoing communication submits a sketch showing railway connections and a compromise location for the proposed bridge. He would have the structure about three-quarters of a mile below Ft. Wayne, but the bridge shown on the sketch is open to one of the main objections raised by the vessel interests, as the plan indicates a pier in the center of the river.)

Referring to a letter which he wrote some time ago to Senator McMillan of Michigan on the Detroit river bridge question, Capt. James Davidson brings out a new and important argument in opposition to the bill. He directs attention to the encroachments made upon the northwestern flour and grain business of late years by southern ports like Galveston and Newport News, which have secured a big export trade through low freight rates made by railways leading to these points, and which have been competing for this trade with the trunk lines and the lake and rail lines leading to New York. He holds that even the railroads, and especially those getting business from the lakes at Buffalo, should discourage any act that would tend to increase the amount of business that is now diverted from the northern lake route to the southern ports. New York should also be interested, he says, in this regard. One individual interest, that of the Vanderbilt's in the Michigan Central road, would alone be benefited by the bridge, while the question of cheap transportation, important to the entire northwest and extending even to European consumers, is involved on the other side of the question. Mr. Harvey D. Goulder, counsel of the Lake Carriers' Association, is now in Washington, preparing to oppose the bridge bill, which is due to come up in the senate on Tuesday next. It is fortunate that the commerce of Detroit river for the present season will be above 30,000,000 tons, showing a gain over last season sufficient to cut a big figure in discussion of the bridge question.

Owners of some of the smaller steel freight steamers are in two or three cases figuring on making changes in them that will fit them for carrying package freight. This is prompted by the demand that has existed during the past season for package freight carriers. The Kearsarge is said to be the handiest package freight steamer that goes into Buffalo.

John Tod, son of Ohio's war governor, and leading member of the firm of Tod, Stambaugh & Co., well-known Cleveland dealers in iron ore and pig iron died suddenly in Columbus, Thursday.

Famous Ohio Case.

Judge Severns of the United States district court has just handed down a decision that adds another chapter to the famous Ohio case, which grew out of the sinking of the steamer Ohio in the Sault river in 1890, through fouling with the steamers Siberia and Mather, the latter of which (the wooden Mather) has since been lost. The Ohio was adjudged to be damaged on the survey as reported by a commissioner to the extent of \$46,347.17. Among admiralty lawyers in the case were John C. Shaw of Detroit and C. E. Cremer of Chicago, for the Ohio; H. D. Goulder, Cleveland, and F. H. Canfield, Detroit, representing the Siberia, and J. H. Hoyt Cleveland, and H. C. Wisner and Alfred Russell, Detroit, representing the Mather. The case was first tried before Judge Hammond, who found all vessels in fault, and decreed two-thirds of the Ohio's damage against the other boats. An important point of law here arose, and the Siberia and Mather excepted to the commissioner's report as exorbitant, and raised the question whether the owners of the Ohio had the right to recover demurrage which was included in the commissioner's report. This was made on the ground that the Ohio's owners by abandonment had parted with their title and right to the use of the vessel, and they therefore could not recover demurrage, which is profit that they claim they would have made from her use. Judge Severns, however, overruled all exceptions and confirmed the commissioner's report, excepting that he adds to such report and enlarges the damages recoverable by the Ohio, by allowing interest on all claims since 1890. The total amount thus decreed aggregate in round numbers, \$64,000. The end of this case has of course not been heard as yet. It will be passed upon by a higher court.

When the two big freight steamers for A. B. Wolvin of Duluth, which are now under way in Cleveland and Chicago, are completed, Mr. Wolvin will have four of the largest freight carriers on the lakes fitted with Babcock & Wilcox water tube boilers, two of them having quadruple engines and two triple expansion, with steam in all cases at 250 pounds pressure. Although Mr. Wolvin is alone in this advance step in marine engineering, it would seem that he has no fears of the results. Capt. Lyons of the Queen City, which has just been laid up after a very successful season, carrying off the record for big cargoes, says that he has had no trouble of any kind with the boilers, and on the contrary, if freights had warranted it, his boat could at any time have been pushed to 14½ miles an hour when running light in open lake. He says that fuel consumption on the Queen City is no greater than on the ordinary run of big steamers, but the points made in favor of the water tube boilers are mainly saving of weight and long life. He says that Mr. Wolvin is satisfied that the boilers will hold out for double the life of the ordinary cylindrical boilers. No difficulty is anticipated by either the Cleveland Ship Building Co. or the Chicago Ship Building Co. in building quadruple expansion engines for the two new Wolvin steamers.

Capt. James Davidson of West Bay City is of the opinion that Erastus Wiman will be successful in his efforts to organize a big company, in which it is proposed to include a large number of Erie canal boat owners and northwestern millers. The promoters of this scheme will give a banquet at the Hotel Waldorf, New York, on Saturday night of this week. They are anxious that their plans shall not be confounded with those of other promoters who have talked of canal boats to run to Chicago and Duluth. They propose a canal business only, operating between Buffalo and New York, and their claims for success against the unprofitable experience of canal boatmen in the past are based on the influence of a big corporation and the advantages to be derived from the \$9,000,000 improvements now under way in the canals. Capt. Davidson says he is to give them a figure on thirty new wooden canal boats, to be made up of tows of four, one steamer to three barges. He says he is positive that Mr. Wiman has big subscriptions to stock in the new company from all the leading millers of Minneapolis and St. Paul. It is probably unnecessary to note, however, that the money will have to be in sight before Bay City's shrewd ship builder puts down any keels for canal boats.

Mr. Gates of New York, who has represented John D. Rockefeller in the development of Lake Superior mines, the building of ships and other big enterprises, was in Cleveland during the week. He saw some of the ships of the Rockefeller fleet Wednesday, probably for the first time.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

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The books of the United States treasury department on June 30, 1895, contained the names of the 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1895, was 360 and their aggregate gross tonnage 643,260.40; the number of vessels of this class owned in all other parts of the country on the same date was 309 and their tonnage 652,598.72, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.13
Sailing vessels.....	1,100	300,642.10
Unrigged.....	487	83,081.91
Total.....	3,342	1,241,459.14

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
Total.....	347	335,433.98

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/4 per cent. of the whole, but largely in American vessels.

Several times since the Chicago drainage canal project has come into prominence it has been urged that an opinion should be had from the army engineers regarding the effect on lake levels that would be produced by drawing from Lake Michigan the immense quantity of water required for the canal. Leading engineers throughout the country who have no connection with government work said that the army engineers could not give an intelligent answer to this question, for the reason that they had been going ahead with all kinds of improvements on the lakes for a great many years past without having collected any reliable information as regards the outflow of the lakes at different important points. As a result of a discussion of this subject, congress asked the war department for a report on the probable effect of the Chicago canal. The report was rather vague, but the army engineers admitted, in part, that data regarding the outflow of water from the lakes was desired. Now it would seem that the war department is urging congress to provide funds for the collection of this information, as the latest report from the secretary contains a paragraph directing special attention to the subject. The secretary says: "But little change has occurred in the water levels of the great lakes during the past year from corresponding levels of 1894, and as no water has yet been drawn for us in the Chicago drainage canal no further facts can be given as to the probable effect of abstracting 10,000 cubic feet of water per second from Lake Michigan. The importance of inaugurating a series of observations and gaugings which will provide reliable data concerning the lake levels and the the probable effect of the Chicago drainage canal and the deepening of connecting channels was stated in my last annual report, but no action in the matter has yet been taken by congress."

It is evidently the intention of Brig. Gen. Craighill of the army engineer corps to secure, if possible, some change in the law relating to the removal of wrecks. Serious delays have occurred on the lakes on several occasions on account of red tape requirements in this regard. Gen. Craighill has now succeeded in having the secretary of war make a special request to congress for a change in the law. The secretary says: "The law provides that a notice of thirty days shall be given to the owner of a sunken or wrecked vessel in any river and harbor of the United States before the secretary of war may direct the removal of such obstruction to navigation. This interval of notice is altogether too long to be consistent with safety to navigation, and is the cause of frequent and well-founded complaint by those

interested in shipping. But little time is required for the preparations necessary to begin such removal of obstructions to navigation, and a change in the law to permit the more prompt exercise of the powers of this department, when individuals are tardy or negligent, is earnestly recommended."

One of the best indications of activity in ship building throughout the country at this time is the scarcity of draftsmen required for work on hulls. Several men from the lakes have of late drifted to government employment at Washington, New York and Philadelphia, and to the ship yards of Newport News, San Francisco and Philadelphia where big government contracts are under way. As the foreigners who have sought this work here of late years are now finding employment without difficulty on the Clyde and in Germany, where there is a boom in ship building, it would seem that our colleges are offered a rare opportunity to prepare young men for this important branch of naval architecture. The future of ship building in this country is certainly encouraging.

The latest naval program in France provides for the construction of one battleship, one first class cruiser, two first class cruisers for coast defence, one-third class cruiser for coast defense, one gunboat, one torpedo boat destroyer and two first class torpedo boats, nine vessels in all. The battleship will have a speed of 17 knots. The first class cruiser will be of the triple screw type, of 11,270 tons displacement, 28,500 horse power and 23 knots speed. The coast defense cruisers of the first class will also have triple screws. They will each have a displacement of 5,500 tons, with 17,100 horse power, and they are also expected to attain a speed of 23 knots.

Referring to the report that he is to take an active part in trying to overcome treaty relations with Great Britain, under which lake ship builders are deprived of the right to build vessels of war of any kind, Governor-elect Pingree of Michigan says, in a letter to the Review, that outside of some advocacy of lake advantages for building war vessels nothing has been done by him, and that at the present time nothing that might be called definite is contemplated, save to continue an interest in the subject.

Professor Moore, chief of the United States weather bureau, states that the average percentage of verification of the bureau's forecasts during the year was 82.4 per cent. The average writer of newspaper squibs may make little of this statement, but the vessel master is always ready to overlook errors of judgment from men engaged in this work. He realizes, probably more than anyone else, the value of the service. He needs no statistics on the subject. His experience is the best proof.

The New York Tribune says: "The secret history of the Texas would make 'mighty interesting reading.' Whether there was any serious scandal connected with her construction or not, there must have been a lot of blundering. It was a blunder at the outset to buy English plans for her. Further blundering was done in modifying them. The result is a ship that can not be reckoned a credit to the navy. It is a pity that the exact responsibility for it can not be fixed."

At a meeting of the directors of the Pacific Mail Steamship Co., held in New York recently, a semi-annual dividend of one per cent., payable Dec. 1, 1897, was declared, and authority was given to President C. P. Huntington to invite tenders for building a new ship of 6,000 or 7,000 tons, with a speed of 16 knots or more, to be used in the China trade.

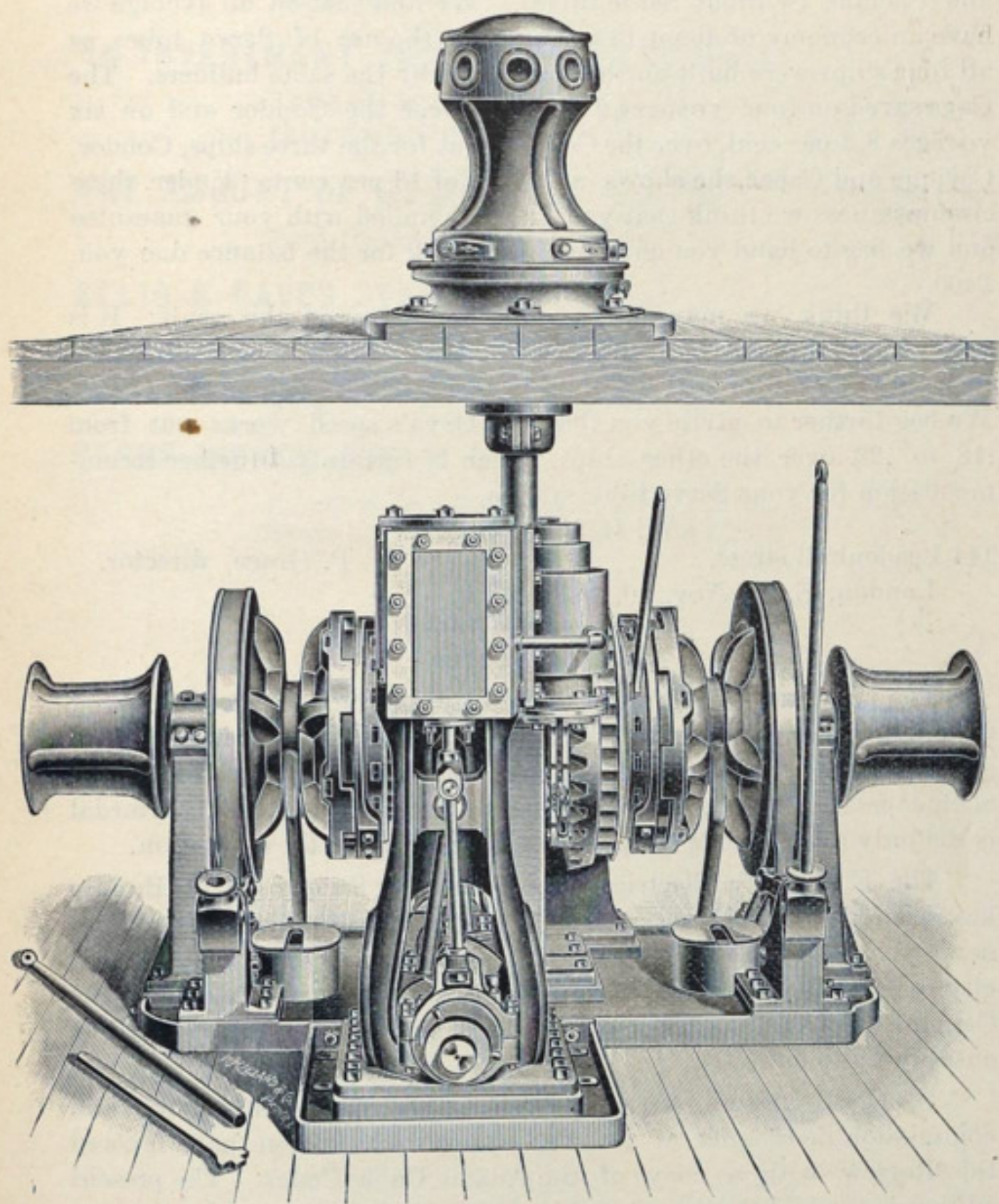
The editor of the Review of Reviews is convinced that the verdict against free silver pronounced on Nov. 3 was conclusive, that Mr. Bryan's cause can not survive defeat, that the south will never again cast so large a vote for it, and, in short, that as a proposition in practical politics free silver's prospects are utterly hopeless.

During the first year of his presidency, President-elect McKinley will have at his disposal quite a number of important staff positions in the army, among them the appointment of a successor to Brig. Gen. Craighill, chief of army engineers, who will retire on July 1 next.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building.

Latest Windlass.

PROVIDENCE STEAM CAPSTAN WINDLASS, NEW STYLE.—MANUFACTURED BY THE AMERICAN SHIP WINDLASS CO., PROVIDENCE, R. I.



Patented June 1, 1880; Feb. 15, 1881; May 1, 1883; July 31, 1888; and July 2, 1889.

The above cut shows the latest Providence steam capstan windlass, embracing all the recent improvements made by the American Ship Windlass Co. By this cut it will be seen how simple the windlass is, how practical it is, how open and convenient it is for operating, and how well supported the machine is at all points where the greatest strain comes in actual use. It will be seen that the wild-cat or chain wheel is solid up against the side bitt, and that the friction band is on the side of the wild cat next to the bitt. The effect of this is that when sudden and severe strains come on the windlass, which are certain to come when in actual use in rough weather, it is impossible to bend the shaft in any way, on account of the wild cat having such a solid support against the side bitt; and the only way in which the windlass could be disabled through the shaft is by the sheering of the shaft completely off, which any one acquainted with such matters can see is impossible. This arrangement insures a safe result under all strains, as the shaft can not be bent, and prevents all of the many accidents to windlasses which result from bending of the shaft. If the shaft remains intact, then it is almost impossible to break the windlass. The locking gear is so simple that any seaman can understand it, and can see what he is doing in locking or unlocking, and with this simple arrangement the wild-cat can be locked or unlocked in one-tenth the time required by any other arrangement that has ever been offered to the public.

This windlass has long stood at the head all over the world, and particularly in this country, but its reputation has only been maintained by keeping it continually up to the times and by improving it from time to time as long experience in practical use dictated. There is less wear with this windlass than any other style of windlass that can be named. It is very simple, very durable, convenient, and thoroughly practical in every respect. The special tools gotten up by the American Ship Windlass Co. insure a windlass thoroughly built, and constant care in the selection of materials—everything of the very best—is proof that there is nothing to detract from the reputation which this windlass has made for itself everywhere.

It has been demonstrated on the lakes, as the larger vessels have

come into use, how very important it is to have a thoroughly reliable convenient and simple windlass, and the attention of the public is called to these facts, which are plainly shown by the cut above. Those in want of a first-class windlass should be particular and call for this machine in their contracts, and they will then be sure of getting the best. The American Ship Windlass Co. in its long course of forty years can refer with pride to every machine which it has ever sent out, and the hundreds of testimonials which it has received from the best authorities in the country prove that its efforts have been appreciated by practical and competent users.

He's a Jim Dandy.

Readers of marine publications in this country will remember several communications regarding the designing of screw propellers, which have appeared of late, and which have been signed "Sir C. Purcell Taylor, Bart, D. Sc., M. A. I. M. E., No. 2 Powis Place, Queen Square, London. The first of these letters was a criticism of Mr. I. McKim Chase's book on screw propulsion. Our English correspondent claims to have a formula that gives him a monopoly of the screw propulsion business, and if we may take his own word for it he is a wonder at figures. Here is a closing paragraph from another letter just received:

"I attribute my success to very careful observation and a better knowledge of the highest branches of mathematics than any one else. That is not surprising, seeing that it was a member of my family (Dr Brook Taylor) who invented the Differential Calculus; that I read the whole of Euclid's works when I was five years old, and that before I was twenty I read many old folios of foreign mathematicians which are quite unknown, even by name, to the various professors of mathematics at English and continental universities whom I have met in after life."

In another part of this same letter the London gentleman of many titles intimates that Froude and other eminent authorities on screw propulsion never did anything during their lives that they should still be kept at propellers. Referring to a communication from Mr. Chase that appeared in the Review of Oct. 29 he says:

"As soon as I noticed the mistake in Mr. Chase's book, I wrote to him and also to the papers pointing it out. Mr. Chase wrote me on Sept. 27 acknowledging my letter and asking me to furnish him with a copy of my formula. That I naturally declined to do. Mr. Chase did not hint then of any doubt about the correctness or value of my formula, and I am surprised that he should express any doubt on the subject in the letter you print, which was apparently written after my refusal to give him my formula reached him. Mr. Chase says he was never able to devise a satisfactory formula; but that is no reason for doubting, or argument against, my having done so. The proper time to dispute my invention would have been when it was announced in 1892. But, so far from its being disputed, I had letters nearly every post from engineers asking me to give them my formula, as Mr. Chase has done recently. So many of these requests came that I was obliged to send a note to the papers that 'I did not intend to publish anything or otherwise give to strangers the result of my expensive researches.' See, for example, London Marine Engineer, page 388, for November, 1892.

"I observe that another gentleman named Mr. Gray has written to the papers, and as his letter (which is amusing) is soon disposed of, perhaps you will grant me the space. Mr. Gray first says that it is impossible to do what I did in 1892 and have done ever since; and he names (amongst others) two dead men who were and are of the same opinion. What have these two poor fellows done in their lives that they are kept at propellers still? We were told once that there shall be no more sea. Mr. Gray evidently knows better, and he ought to set up as a medium at once. In the next paragraph Mr. Gray contradicts himself and tells us what a certain firm has done, and still does, designing propellers. He goes on to praise that firm's work, but he does not tell you that he is the London agent for that firm. This is the fact, and it at once lowers his professedly impartial praise to the level of mere advertising declamation. As soon as my invention was announced in 1892, many imitators sprang up who advertised that they were all capable of designing perfect propellers. I do not advertise, for I have more to do now than I can easily manage. My success has been my advertisement, and that reminds me of what Dickens wrote—'If a man would commit an inexpressible offense against any society, let him be successful; they will forgive him every crime but that.'"

Around the Lakes.

James Lendebarker, who has been, since 1850, a chief engineer on lake vessels, died at his home in Chicago, Monday.

Counselman & Co., big grain shippers of Chicago, are said to be figuring with the Pennsylvania Railway Co. for the construction of two new elevators at Erie.

Capt. Patrick Murphy, who was a few years since retired from the United States steamer Michigan, on which he had been pilot, died Tuesday, at Erie. He was in his seventy-third year.

Stocks of wheat in store at Duluth and Superior are very light, and it is claimed that there will not be more than 3,000,000 bushels in the elevators at these points when navigation opens next spring.

An engraving of the steamer City of Buffalo in a transparent cake of ice adorns one corner of a postal card in which General Passenger Agent Herman of the Cleveland & Buffalo Transit Co. announces dates on which boats of his line are to be laid up for the winter.

A Washington dispatch says that the postmaster-general will direct special attention in his annual report to the success of the Detroit river post office. This should prompt an extension of the delivery service on the lakes, probably to one or two other points like Detroit, and to branch offices on the docks in leading ports.

Citizens of Chicago seem to lose none of their old-time vigor. Having secured a big appropriation for river dredging from the government on the claim that the war department was exercising jurisdiction over the river, the shipping interests of that port now want a part of the funds applied to widening the river and improving it in ways other than dredging.

On Dec. 1 grain receipts at Buffalo had reached a total that was 22,000,000 bushels in excess of receipts in any previous year. The total receipts of grain, not including flour, from the opening of the navigation season to Dec. 1 was 154,338,921 bushels, against 132,808,238 bushels in 1893—which year held the former record. Of flour 9,245,790 barrels have been received thus far this season, which exceeds last year's receipts by 1,345,340 barrels, but are over 1,000,000 barrels less than in 1893 and 1894. The total receipts of grain, flour included as grain, are thus far 200,567,871 bushels, exceeding the receipts of 1893 (highest previous record) by 14,479,193 bushels. Hard coal shipments from Buffalo show a small decrease. The total to Dec. 1 was 2,320,668 tons, against 2,496,033 tons on the corresponding date in 1895.

To Compound Another Vessel.

The Detroit Dry Dock Company has made arrangements with Mr. W. D. Rees of the Republic Iron Co. to compound the engines of another of the Republic company's vessels, the Continental, and to give her a new boiler fitted with the Howden system of hot draft. The new engines will be 21 and 44 inches diameter by 36 inches stroke, and the boiler will be 12 feet 3 inches by 11 feet 6 inches. The steamer Colonial, which is to be improved in the same manner, is also at Detroit. The management of the Dry Dock Company is greatly pleased with orders of this kind as a result of their efforts in proving the claim that the artificial draft which they have now applied to a large number of the older class of vessels, will enable these vessels, when attended by suitable changes in machinery, to reduce operating expenses to an extent that will permit of their being kept in commission at fair profit.

The Manufacturers' Advertising Bureau is one of New York's many unique business concerns. Its purpose is the management of newspaper work and advertising for manufacturers and the trade journals are its field. The idea of such a bureau originated with Benjamin R. Western. It is not new. It has been in operation seventeen years. Mr. Western formerly published the Engineering and Mining Journal, the Manufacturer and Builder and the Coal and Iron Record, all of New York. Offices of this bureau are at 126 Liberty street, New York.

Hon. Horace G. Snover, member of congress of Port Austin, Mich., has promised to take up with the war department, immediately upon going to Washington, the matter of securing an appropriation sufficient to remove a few shallow spots that now prevent deep-laden vessels from passing on the American side of Stag island, St. Clair river.

Economy of Serve Ribbed Tubes.

Messrs. J. Brown & Co., Limited, Atlas Works, Sheffield, Eng.—Gentlemen: We have now completed our comparison of the consumption of coal by the Coya (Serve tubes) with the Condor, Capac, and Cacique (without Serve tubes). We find that on an average we have an economy of about 13 per cent. by the use of Serve tubes, as all four ships were built on the same lines by the same builders. The Coya saved on four voyages 9 per cent. over the Condor and on six voyages 8.2 per cent. over the Condor, but for the three ships, Condor, Cacique and Capac, she shows a saving of 13 per cent. Under these circumstances we think that you have complied with your guarantee and we beg to hand you enclosed our check for the balance due you, £400.

We think we may fairly compliment you on the result. It is somewhat a strange fact that the Condor, built on exactly the same lines, burns a ton of coal less than her sisterships Cacique and Capac. We beg further to advise you that the Coya's speed works out from .18 to .22 over the other ships, which is certainly a further recommendation for your Serve tube system.

W. R. Grace & Co.,

144 Leadenhall street,

London, E. C., Nov. 10, 1896.

M. P. Grace, director.

Trade Notes.

The Henry R. Worthington Company, manufacturers of pumping machinery, have just received word through their London office that the exhibit of Worthington pumps at the Hungarian national exhibition at Budapest has been awarded a grand millennium medal. This medal is the only award made for pumping machinery at the exhibition.

The F. P. Little Electrical Construction & Supply Co. of Buffalo has secured the contract for installing the electric light plant in the new steel vessel that is being built by the Union Dry Dock Co. of that city for the Standard Oil Co. The plant will consist of one of the General Electric Co.'s latest type marine generating sets, and will be entirely up to date.

F. O. Houghton & Co., ship brokers, steamship agents and commission merchants, of No. 115 State street, Boston, have favored the Review with a copy of the Adams Cable Codex. The present edition is the eighth edition of this work. It may be used by anyone to save expense in cabling, as the publishers have arranged a system of correspondents so that the party addressed need not have a copy of code.

The E. W. Van Duzen Co. of Cincinnati invites any of our readers who are in need of a good cheap pump, one that can not freeze up, they say, nor get out of order, to give consideration to their steam jet pump, which is advertised on another page. Thousands of these pumps are in use. Messrs. Kinzer & Schaeffer of Blocksburg, Va., say: "We are using your No. 7 'L' jet pump in our coal mines. We have a 10-horse power boiler and raise the water 100 feet. It has given entire satisfaction." The manufacturers say they are positive that a more successful pump can not be found for the money. For a catalogue, write the A. W. Van Duzen Co., Cincinnati.

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Washington, D. C., December 1, 1896. Sealed proposals will be received at this office until Wednesday, the 30th day of December, 1896, for furnishing the materials and labor of all kinds necessary for the construction, equipment and delivery of three first-class composite light-vessels and two steam tenders. Bids will be received for each vessel or class of vessel separately, or for all five of the vessels, all to be delivered on the Atlantic coast. An alternate bid will be received for one of three light-vessels, to be delivered at San Francisco, Cal. The said vessel or vessels must be completed and delivered within ten calendar months from date of the approval of the contract by the Secretary of the Treasury, and bidders are informed that because of the urgent need of the speedy delivery, the element of time to be consumed in construction will be given due consideration in determining the award of the contract, and in each case the contract will be awarded to the lowest best responsible bidder. Each proposal must be accompanied with a certified check payable to the order of the Secretary of the Treasury, in the sum of five thousand dollars (\$5,000). The certified check of the successful bidder will be retained until the execution of a formal bond or contract, and the approval of the same by the Secretary of the Treasury, and the certified checks of the unsuccessful bidders will be returned immediately after the proposals of the successful bidder have been accepted. Forms of proposals, plans and specifications showing what is required, can be had or seen by applying to this office. The right is reserved to reject any or all bids and waive any defects. JOHN G. WALKER, Rear-Admiral, U. S. N., Chairman. Nov. 3

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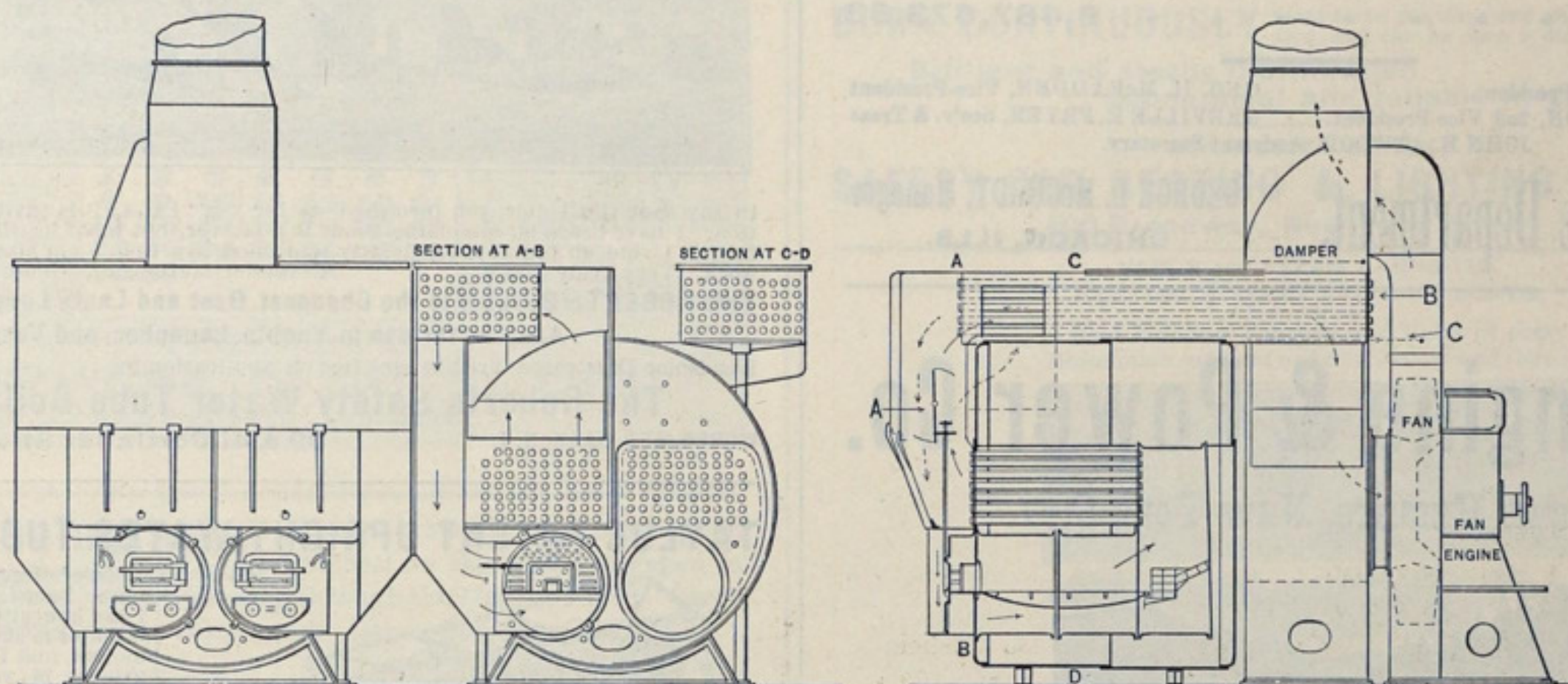
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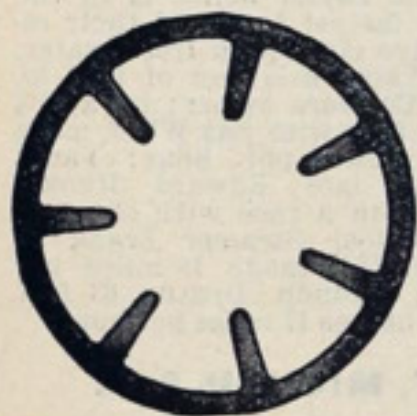
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In addition to having the Ellis & Eaves system of draft. The draft will save 20 per cent. of the fuel and the tubes from 10 to 15 per cent. additional.



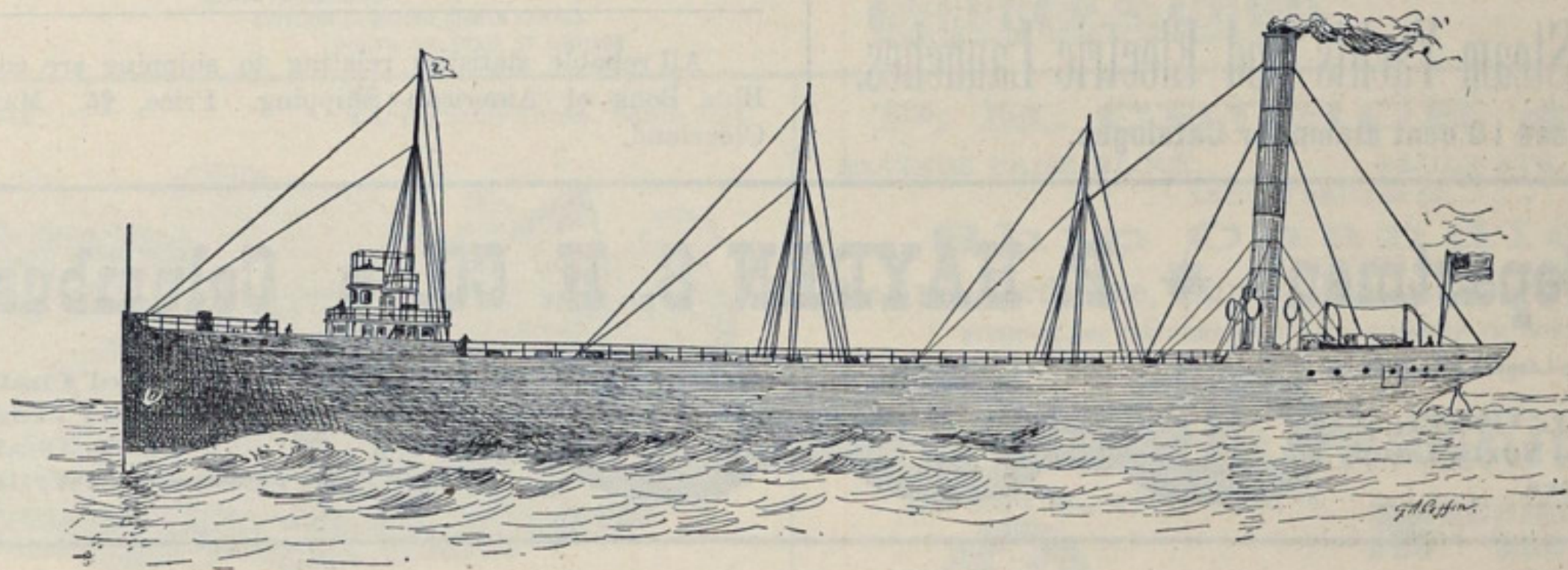
IF YOU ARE SKEPTICAL

You can refer to a table on pages 196-97 BLUE BOOK OF AMERICAN SHIPPING, which gives the coal consumption of ten modern lake steamers an average of 2.22 pounds per horse power per hour.



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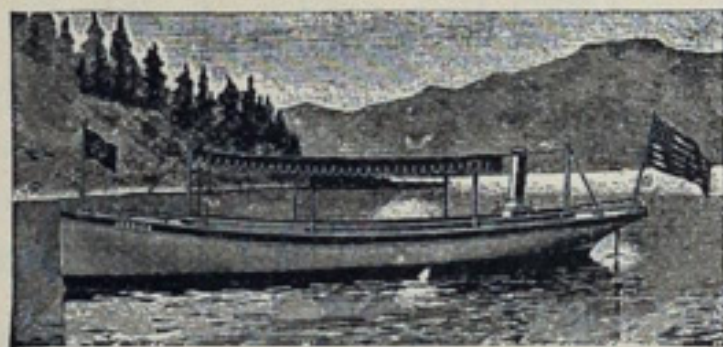
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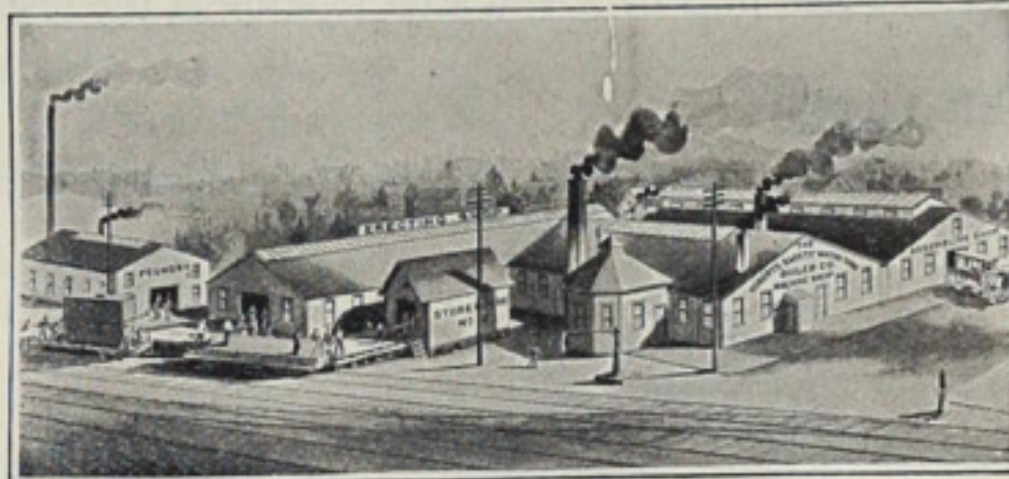
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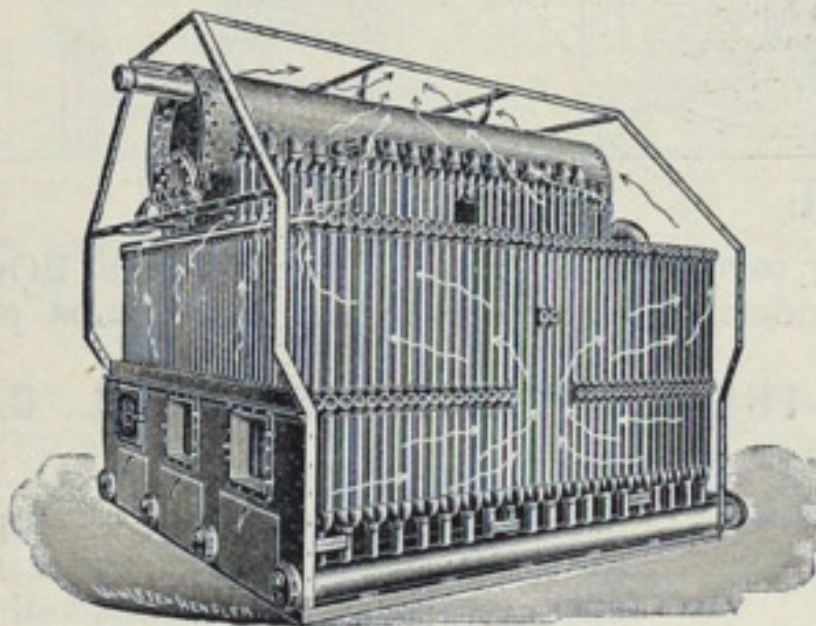
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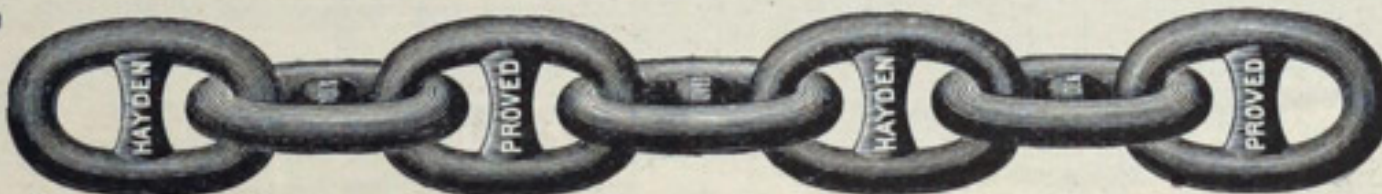
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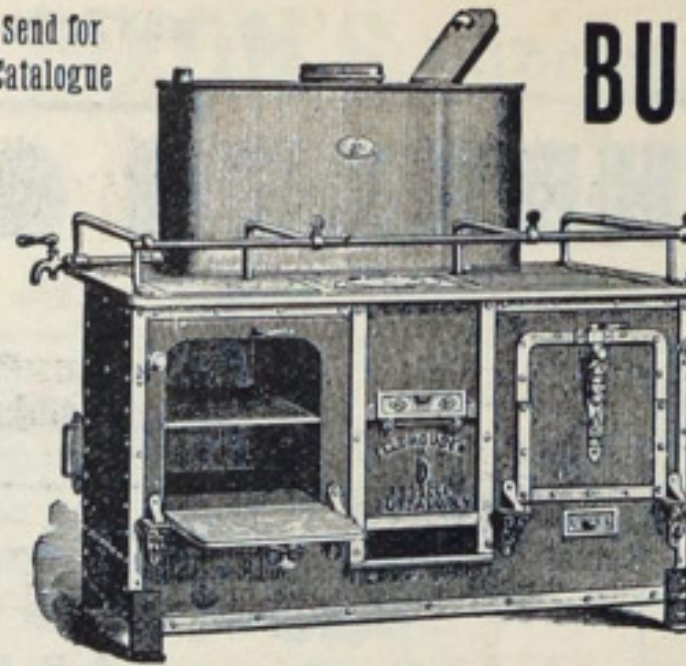
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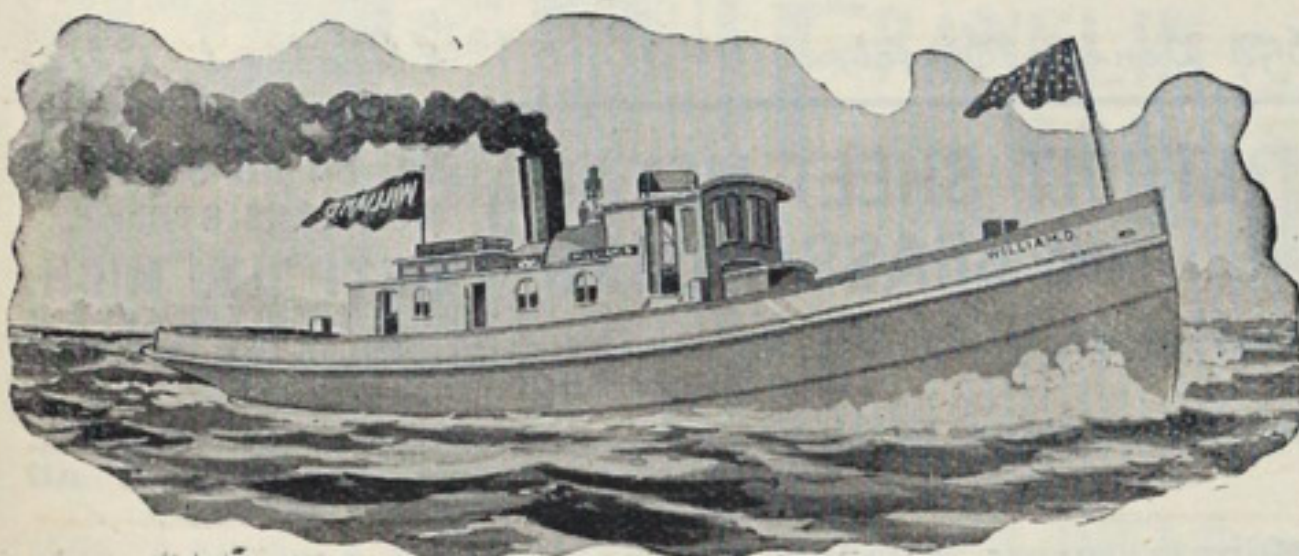
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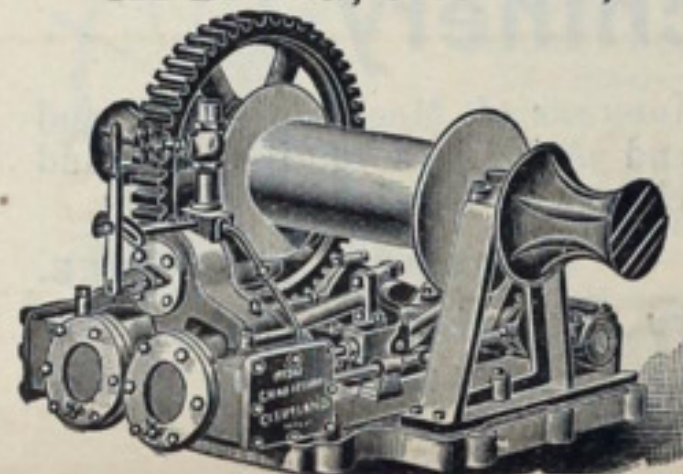
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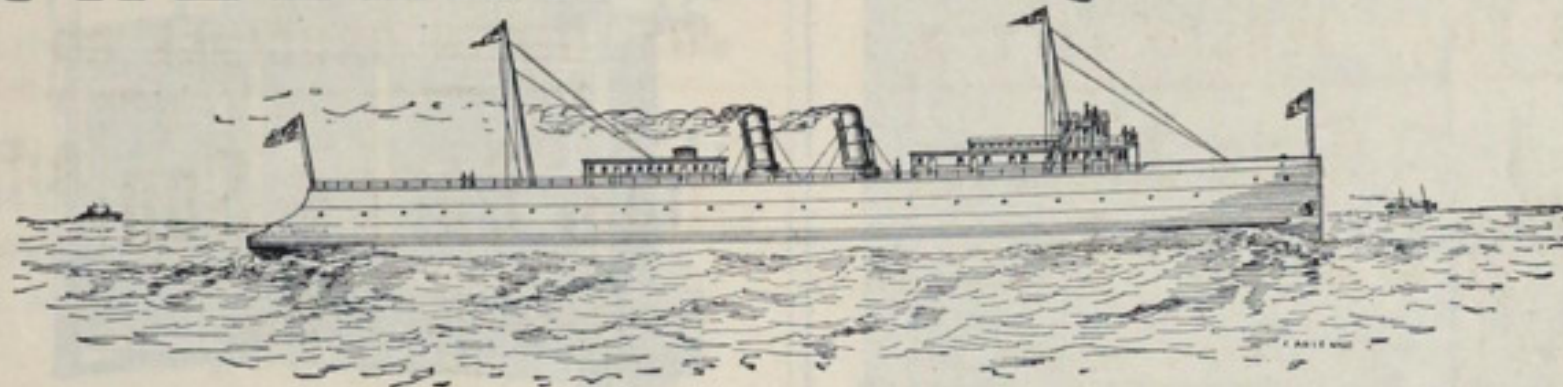
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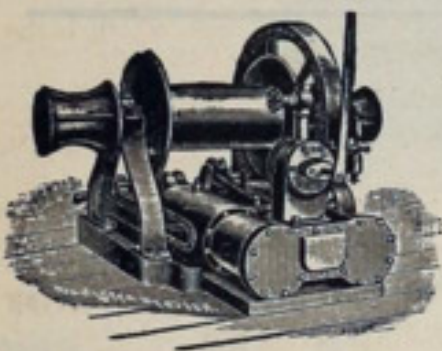
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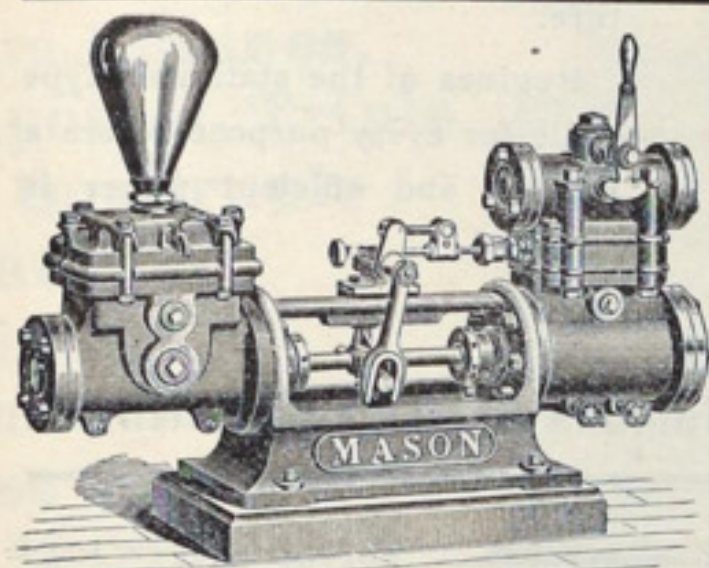
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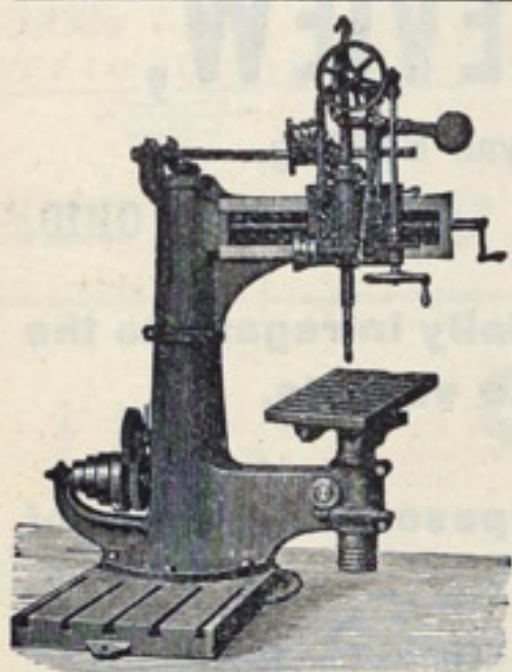
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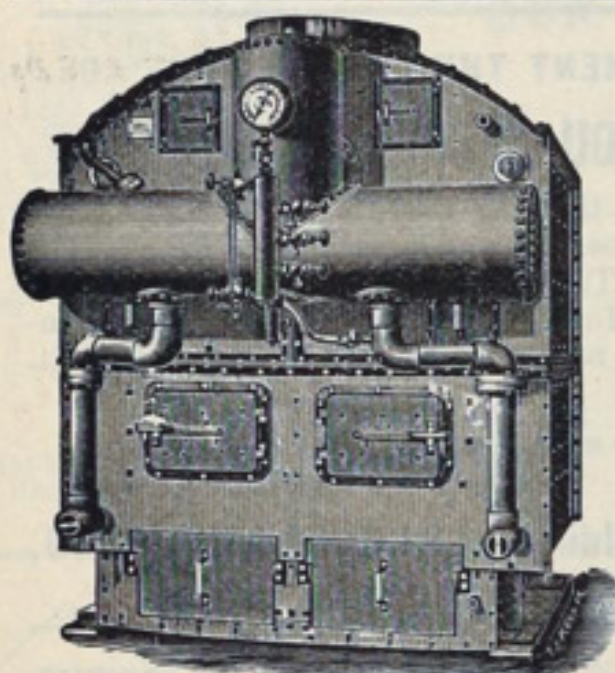
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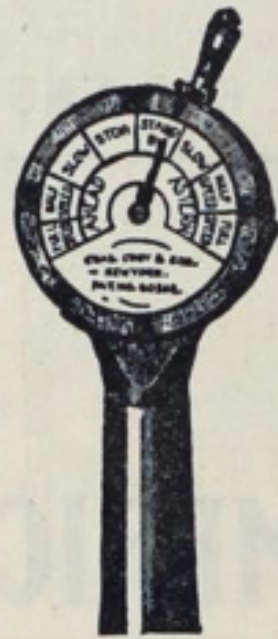
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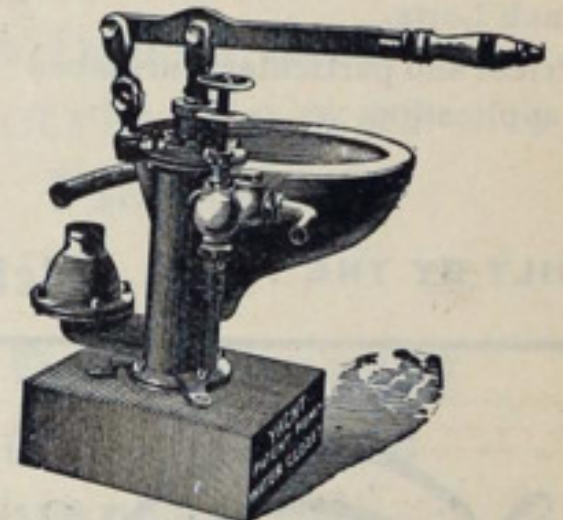
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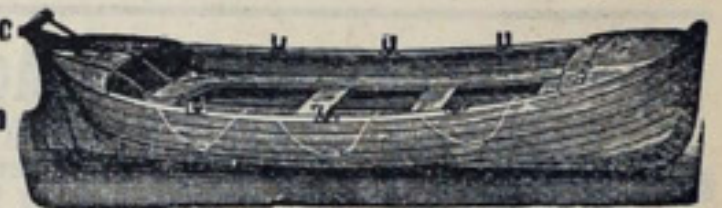


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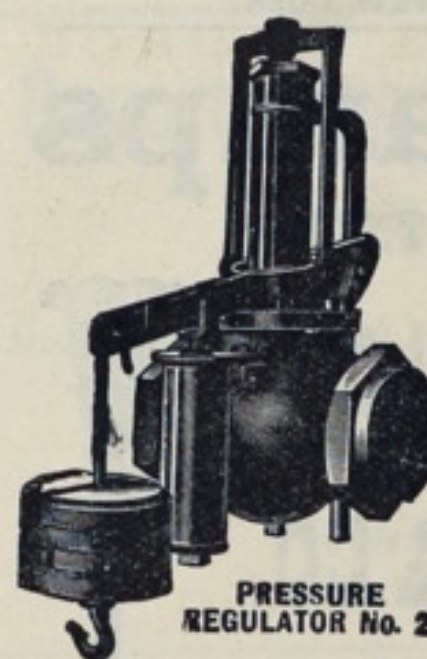
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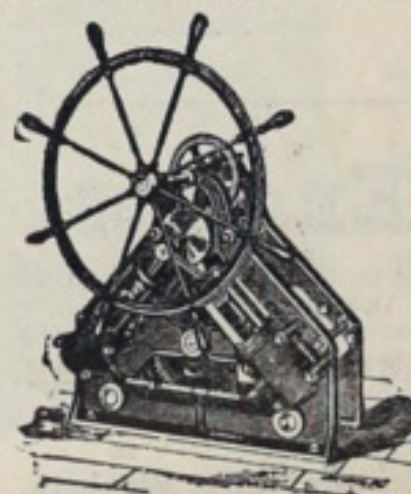
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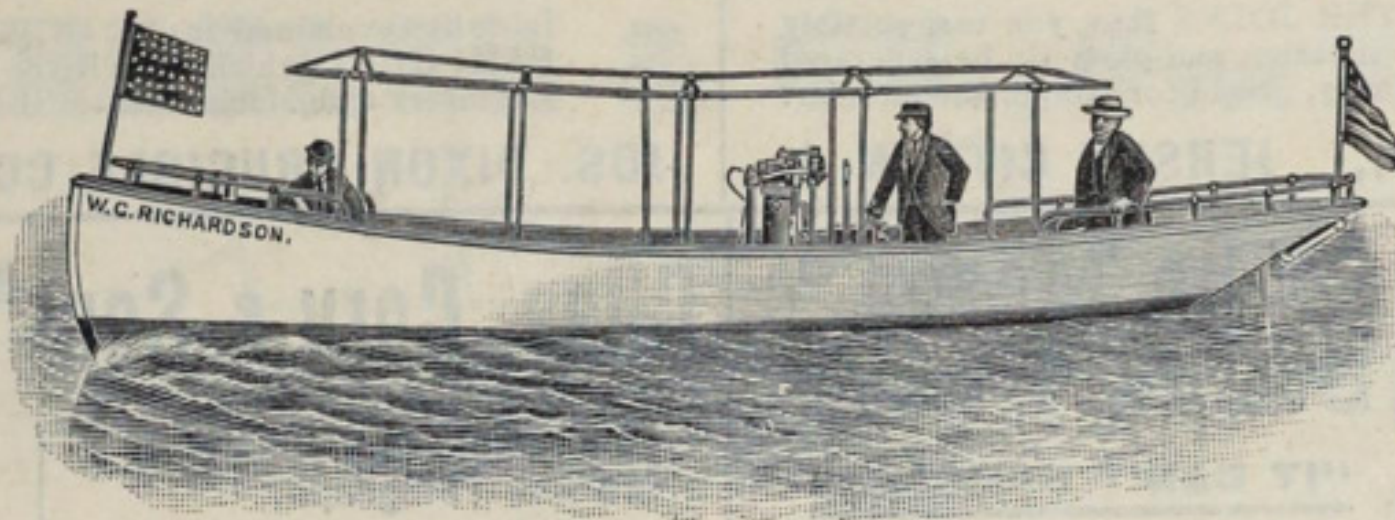
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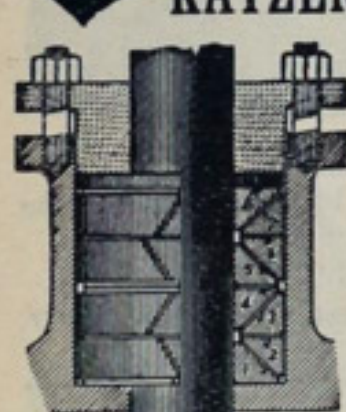
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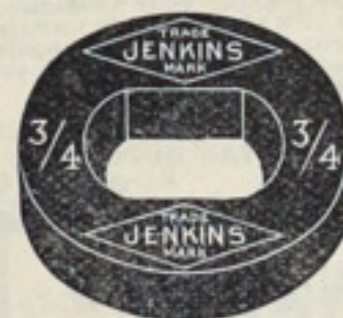
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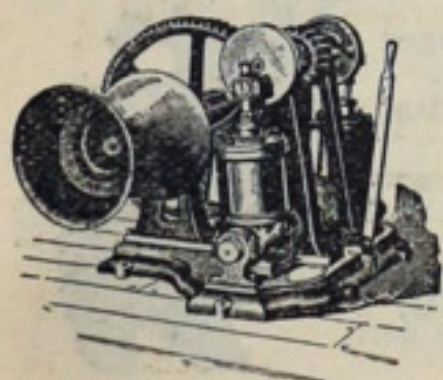
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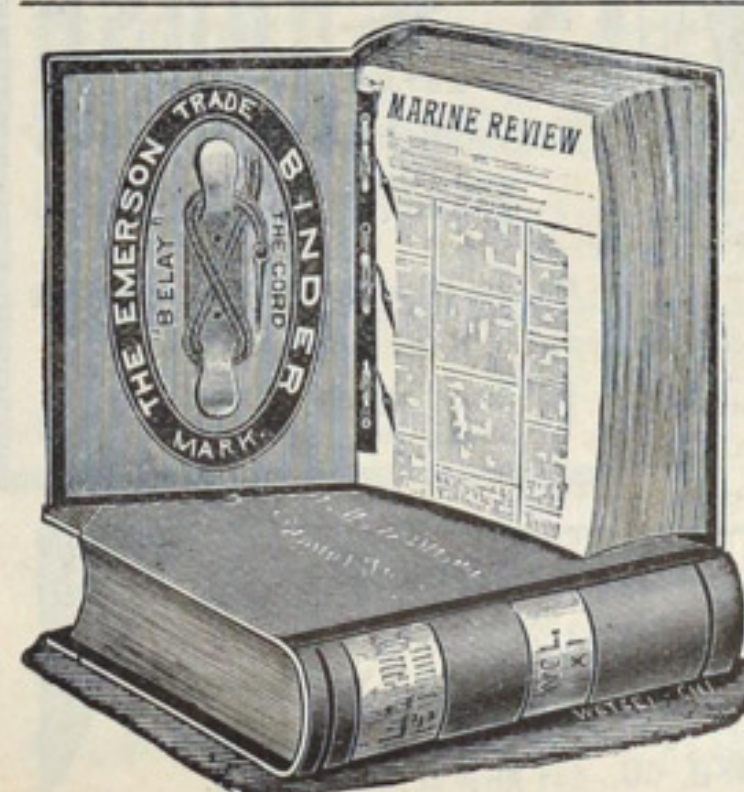
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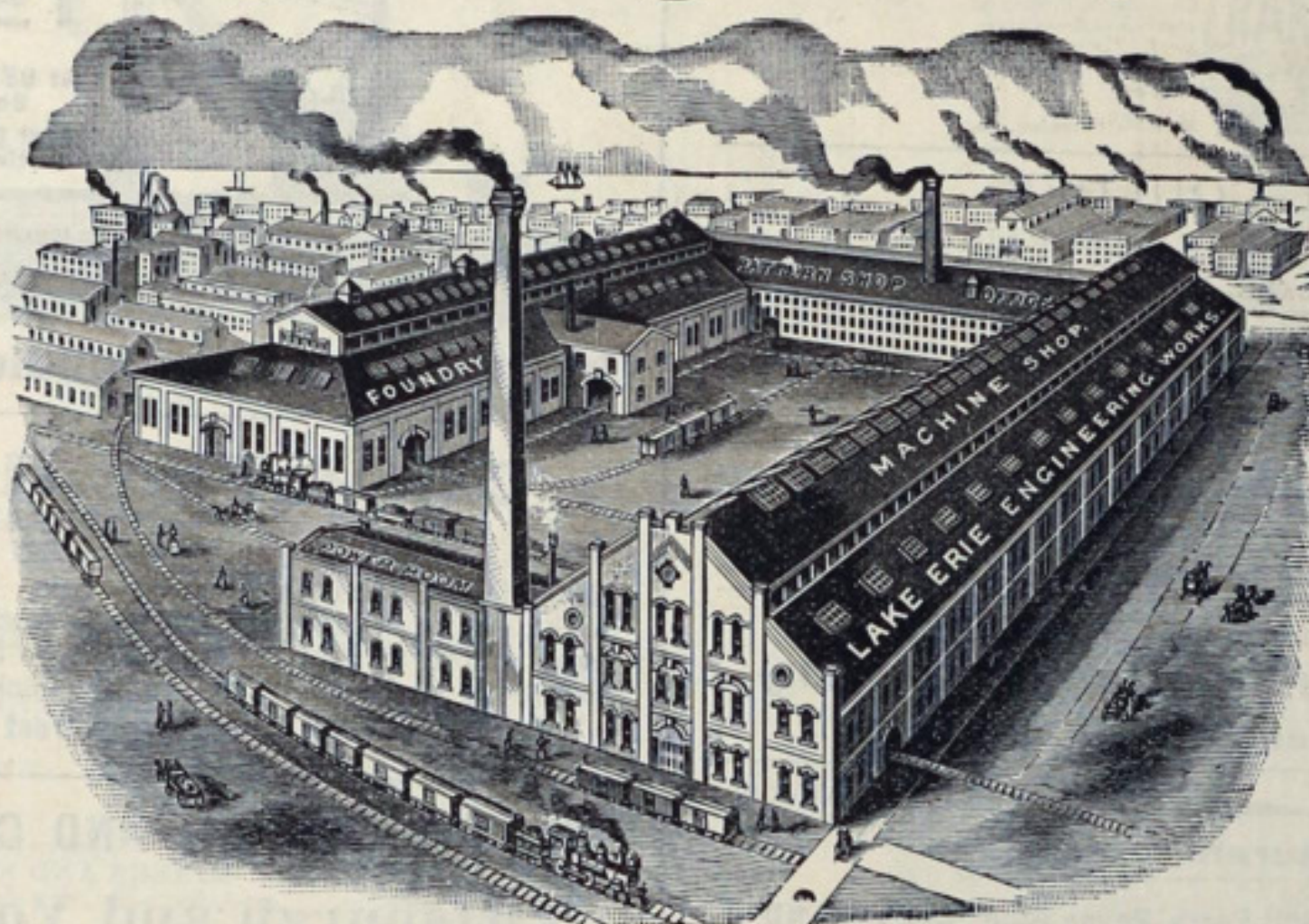
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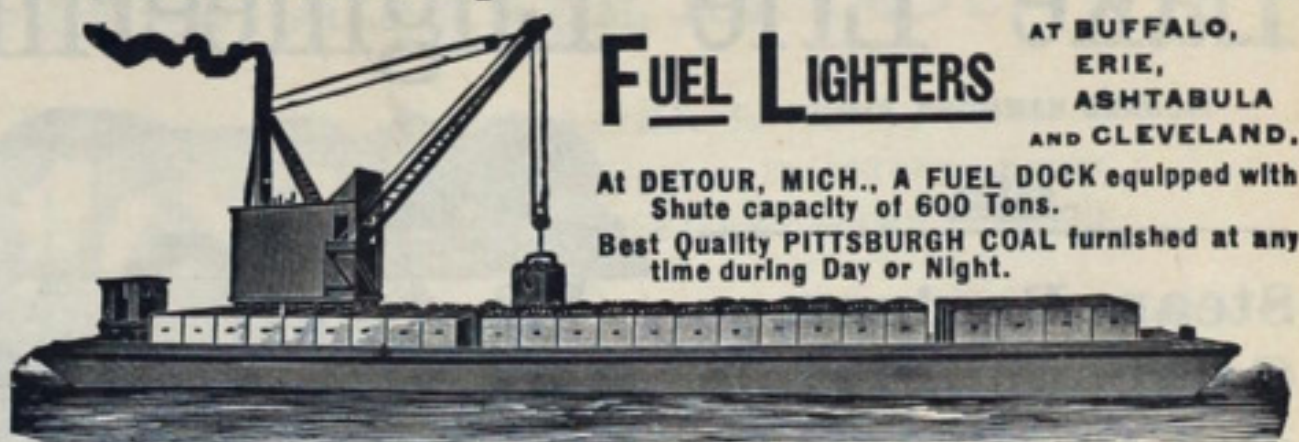
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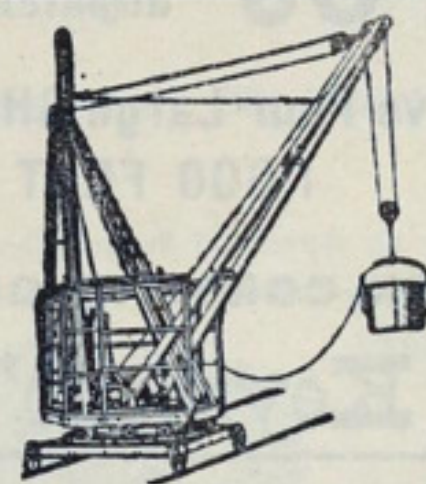
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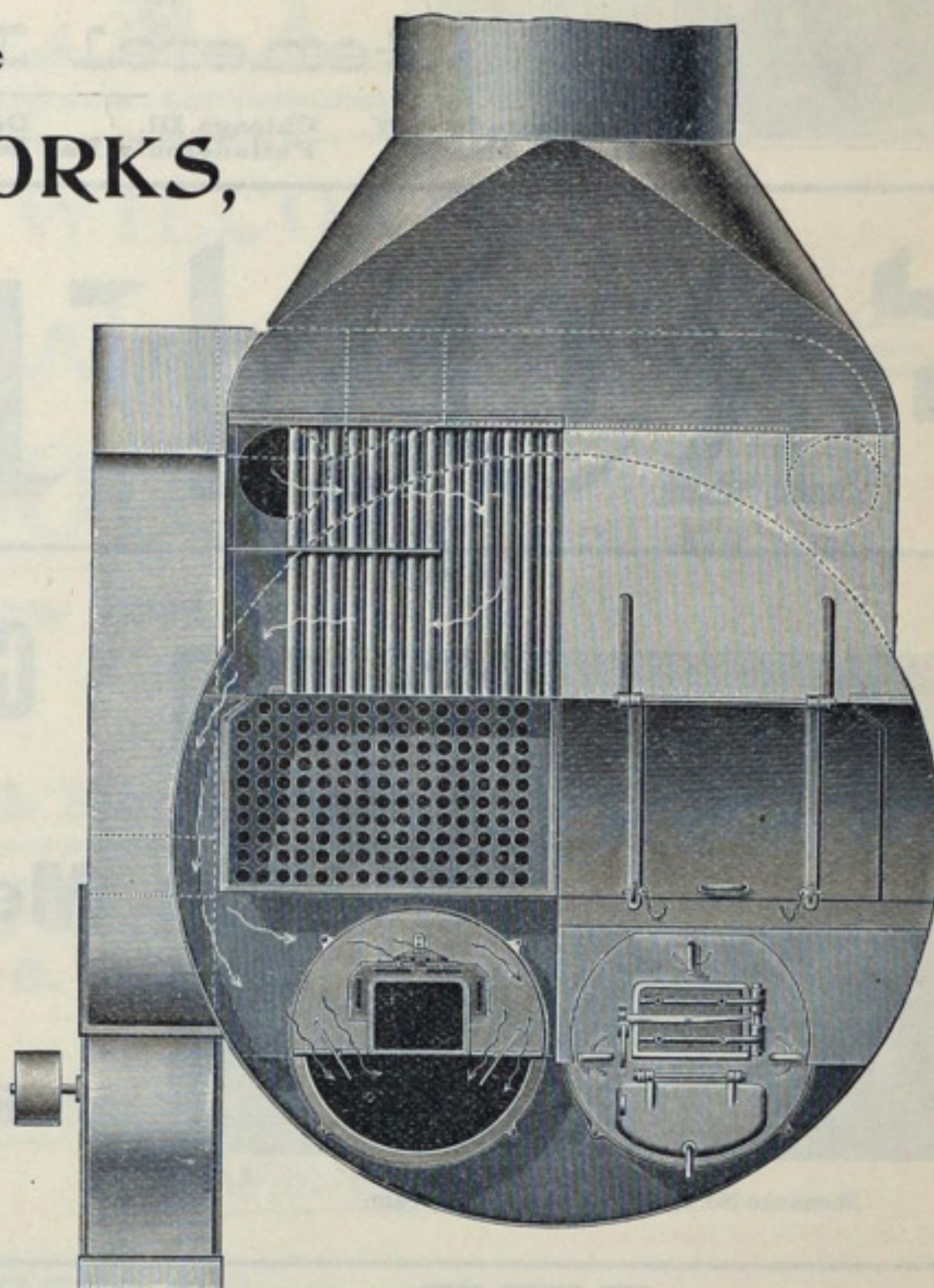
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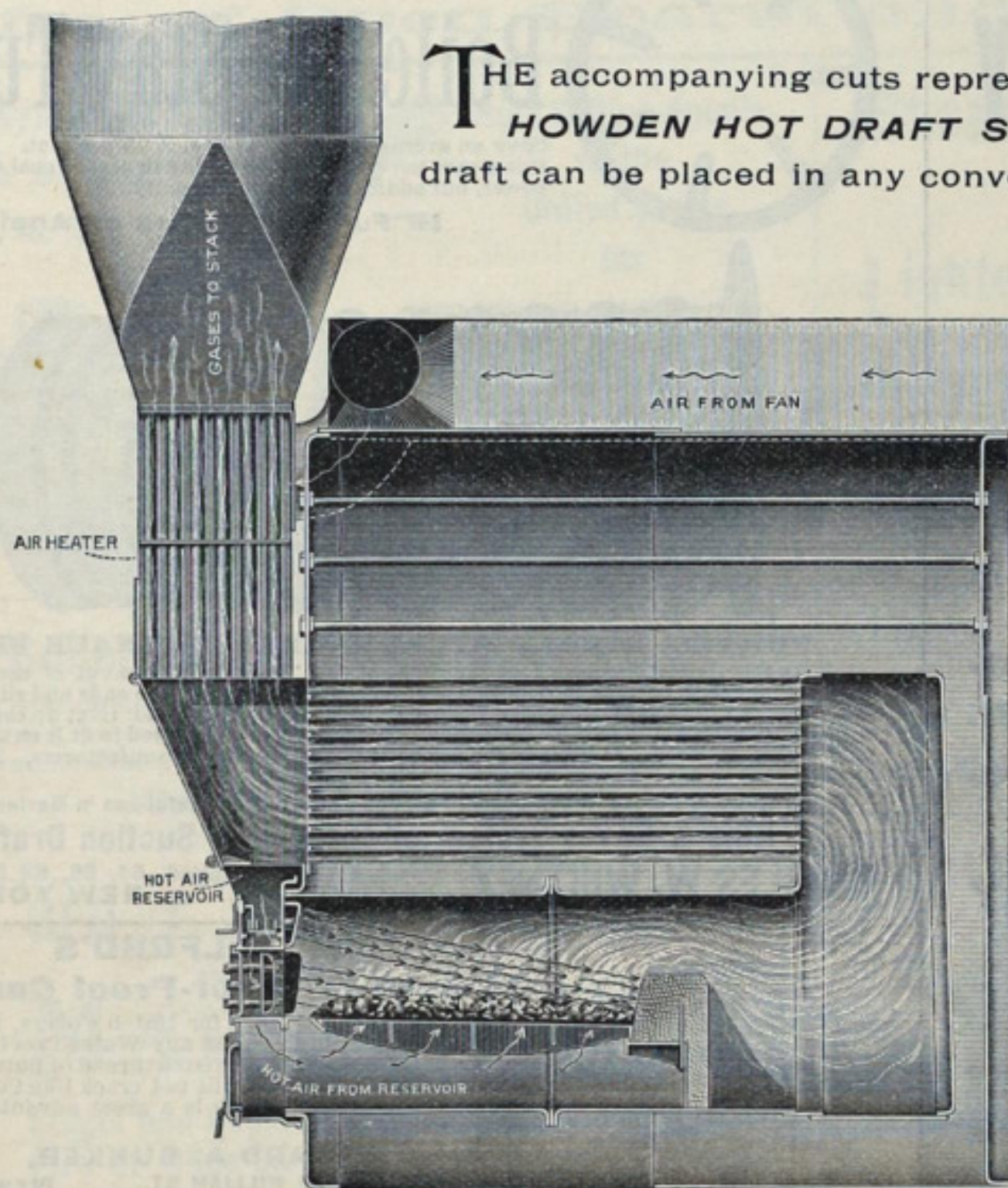
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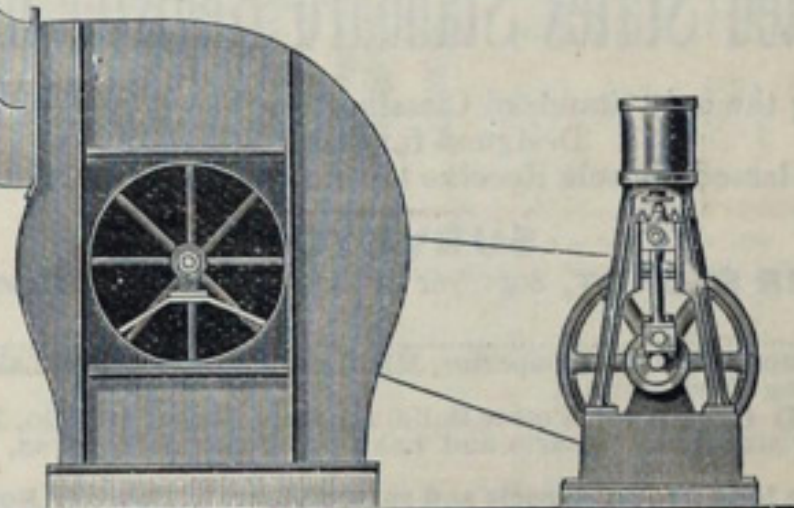


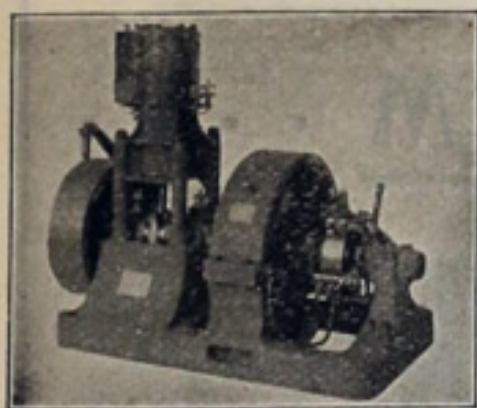
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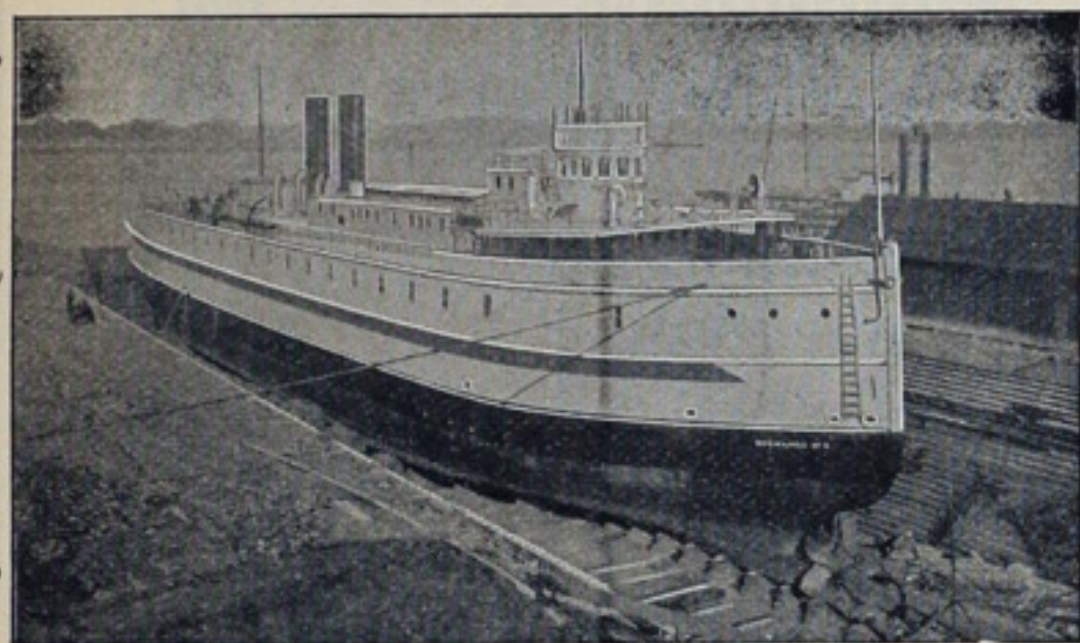
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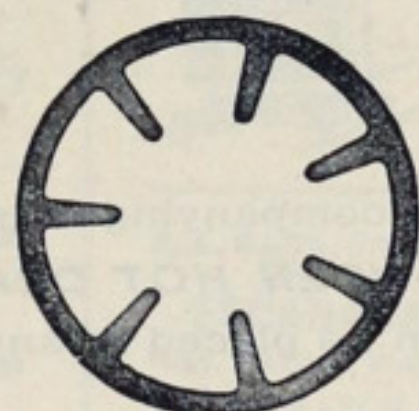
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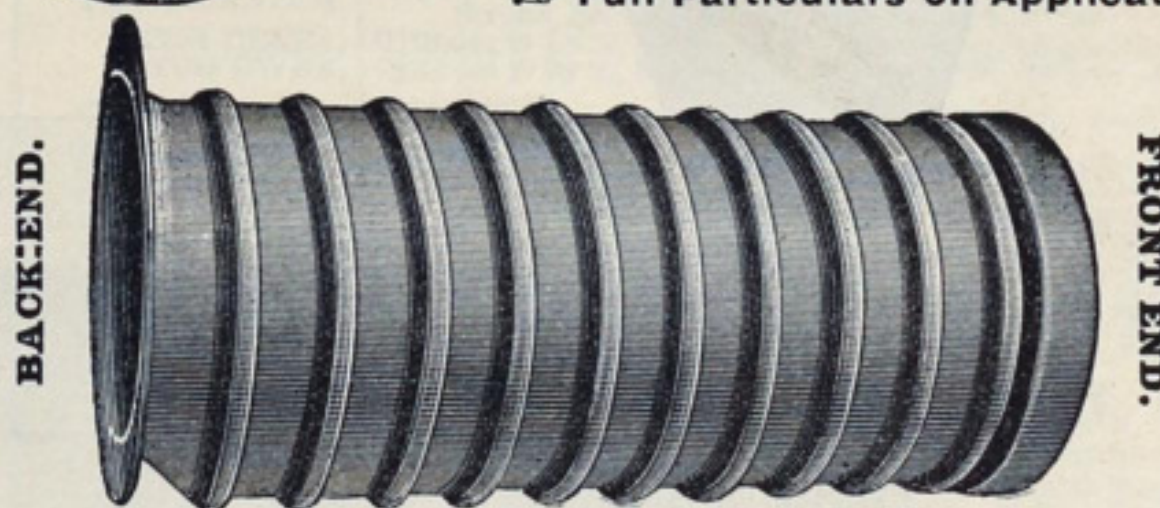
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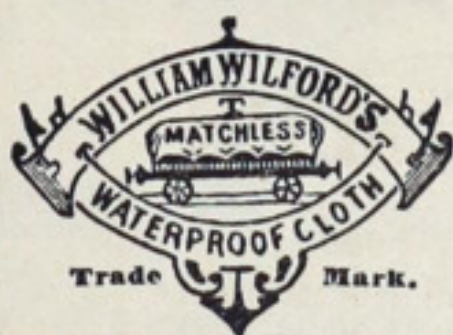
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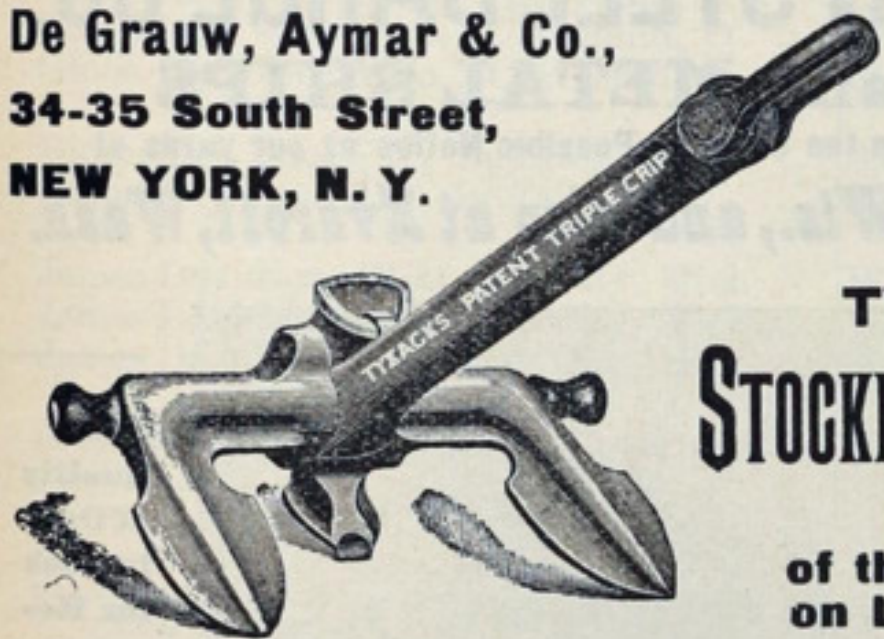
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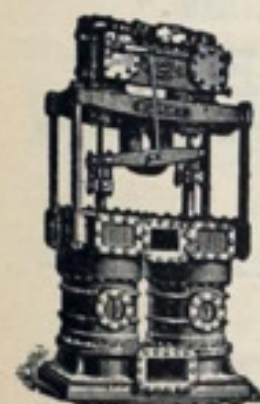
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Steamboat Fuel at Ashtabula. Large Supplies of Best Quality.

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Storage of 650 tons. Dis-
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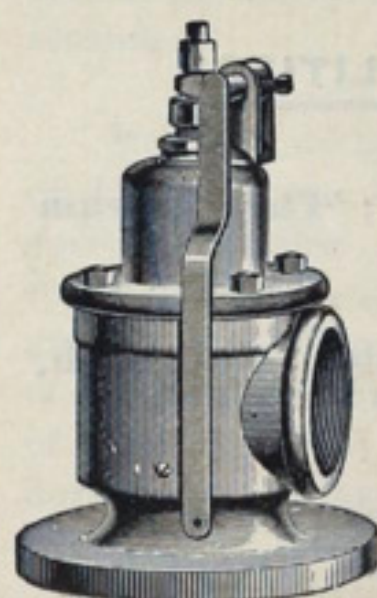
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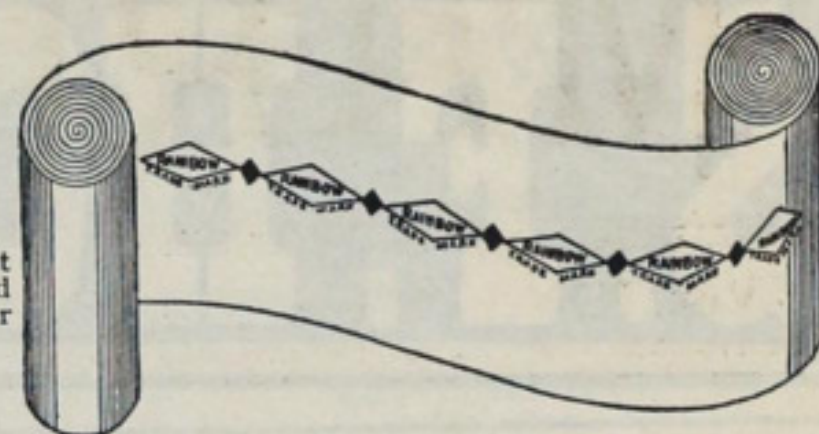
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Respectfully yours,

HENRY J. REYNOLDS, Chief Engineer Steamship North Land.

On board Steamship North Land, September 12, 1895.



RAINBOW Is the only Packing in the World that will
Successfully hold High Pressures.

BEWARE OF IMITATIONS.

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REPAIRING
A SPECIALTY.

Dimensions of Dock:

Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

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IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT.
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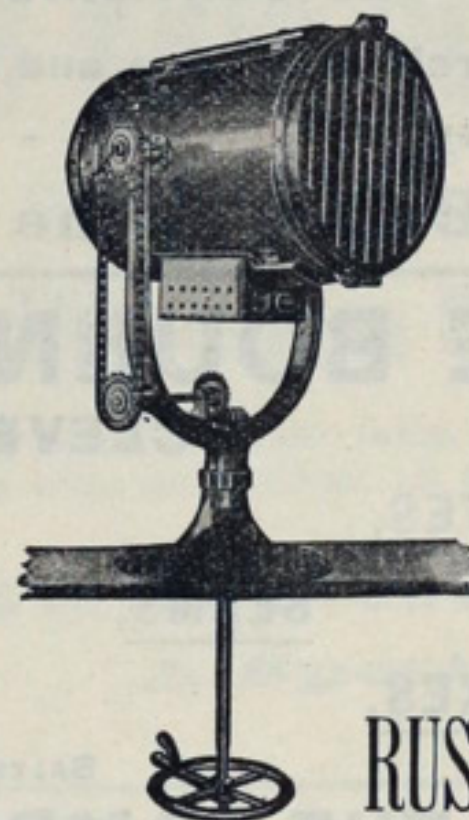
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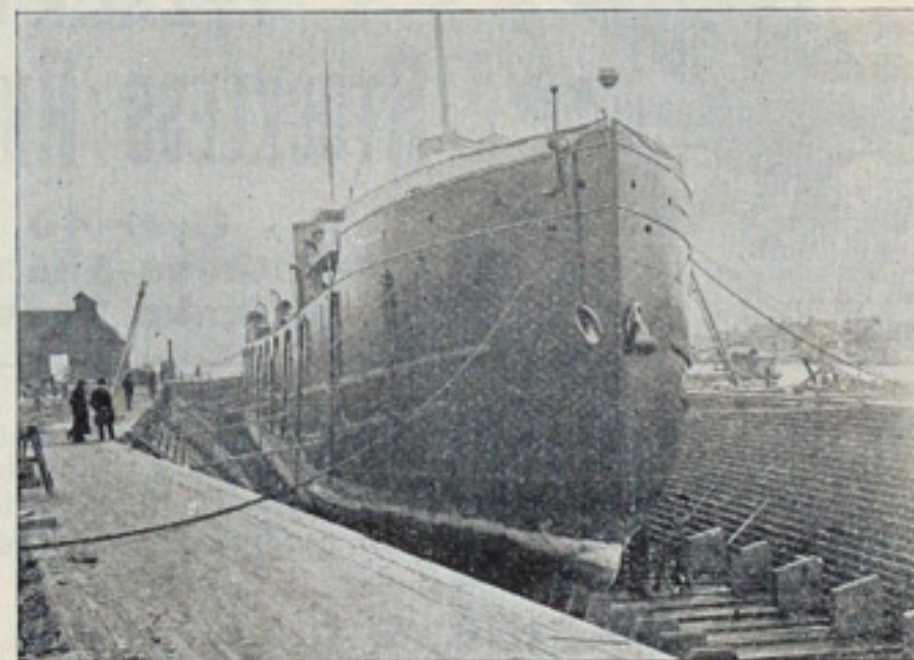
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of Oak
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pairing
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SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in.
Breadth, Top.....90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom.....52 "	Depth over Sills.....18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

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A number of Propellor Wheels in stock at Dry Dock.

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